PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
ARP2662

TWIN–TRAY COMPACT DISC PLAYER

PD-P730T

PD–P730T HAS THE FOLLOWING :

Type	Power Requirement	Remarks
AEMXJS	AC power supplied from power transformer's secondary of other system component	
ABXJS		
ADL		

- **This manual is applicable to AEMXJS, ABXJS and ADL types.**
  For the mechanism description, refer to the service guide ARP2144 for PD–Z74T.
- **For ABXJS and ADL types, refer to page 37.**
- **These products are systems components.**
  Each of these products does not function properly when independent; to avoid malfunctions, be sure to connect it to the prescribed system component (s), otherwise damage may result.

According to ADL type; for the system composition, packing, accessories, instruction manuals etc., refer to the service manual ARP2682 for XS-P730M and XS-P730T.

CONTENTS

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1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for laser radiation

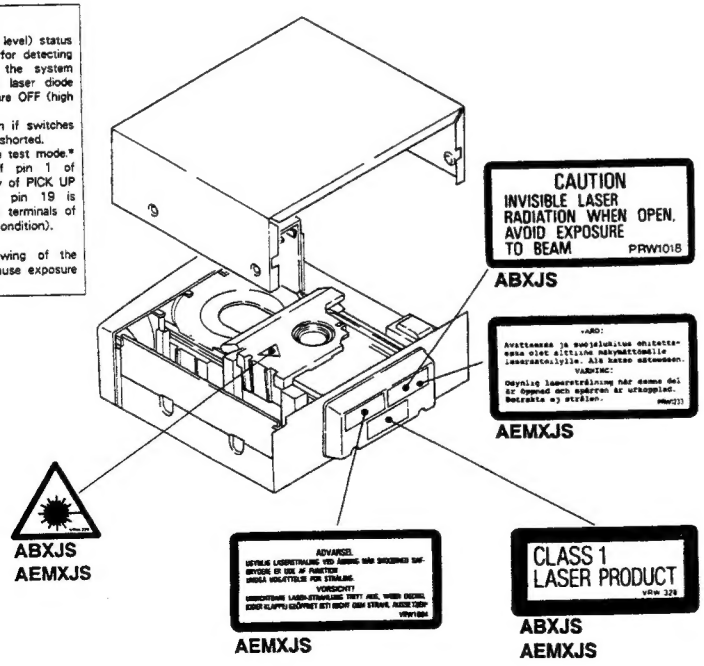
LABEL CHECK (TWIN type)

Additional Laser Caution

1. Laser Interlock Mechanism
The ON/OFF (ON : low level/OFF : high level) status of the U (S601) and L (S603) switches for detecting the disc clamp state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches U and L are OFF (high level).
Thus, the interlock will no longer function if switches U (S601) and L (S603) are deliberately shorted.
The interlock also does not operate in the test mode.*
Laser diode oscillation will continue if pin 1 of M51593FP on PREAMP BOARD assembly of PICK UP assembly are connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).

2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

* Refer to page 29.



2. DISASSEMBLY

2.1 REMOVING THE MECHANISM ASSEMBLY

- Refer to "4. EXPLODED VIEWS" on pages 7 and 8.
  ····(screws of *1 to *4)

1. Remove the bonnet by removing five *1 screws.
2. Insert your fingers between the twin-tray mechanism assembly and under base (See Fig. 2-1) and open the tray I and II by turning the idler gear, then remove the name plate. (This is the preparation for removing the front panel.)
   - For the tray I, turn the idler gear clockwise. For the tray II, turn the idler gear counterclockwise.

   Note: Be careful not to break the claws at the bottom of the name plate, since they are fragile.

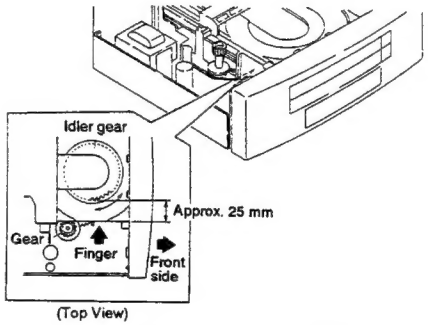


Fig. 2-1 Pull out the tray to your side

REMOVAL OF TRAY I AND TRAY II

3. Open the tray I.
4. Insert the flat blade screwdriver into the slit in the left of tray I. Pull out the tray I by pushing the screwdriver.

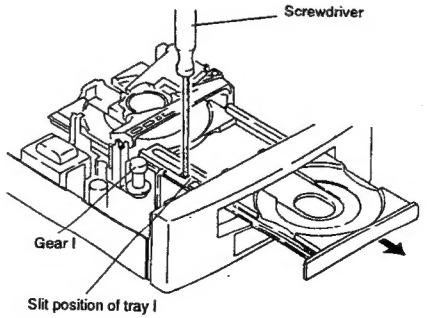


Fig. 2-2 Remove the tray I

* When remove the tray II, open it first, insert the flat blade screwdriver into the slit in the right of tray II, and pull out the tray by pushing the screwdriver.

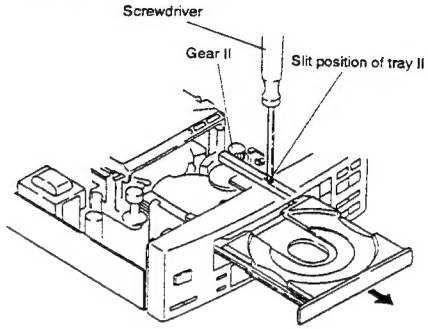


Fig. 2-3 Remove the tray II

5. Remove the rear base by removing four *2 screws and front panel by removing four *3 screws.
6. Remove the four *4 screws fastening the twin-tray mechanism assembly.
7. Remove the clamper clamping the flexible cable, comes from the pick-up assembly, on the mother board assembly.

2.2 MOUNTING OF TRAY I

1. Set the disc II to the clamp position and open the tray I.
2. Align the 1st tooth of tray I to ungrooved portion of gear I, and insert the tray I.

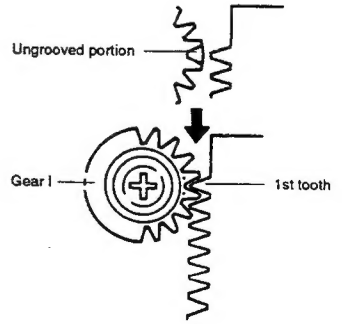


Fig. 2-4

2.3 MOUNTING OF TRAY II

1. Set the disc I to the clamp position and open the tray II.
2. Align the 1st tooth of tray II to □ marked position of gear II, and insert the tray II.

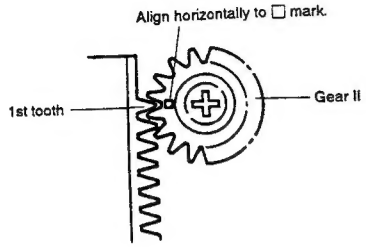


Fig. 2–5

2.4 MOUNTING AND POSITIONING OF MAIN CAM, FOLLOW GEAR, GEAR I AND GEAR II

Set the following gears to the position as shown by arrows.

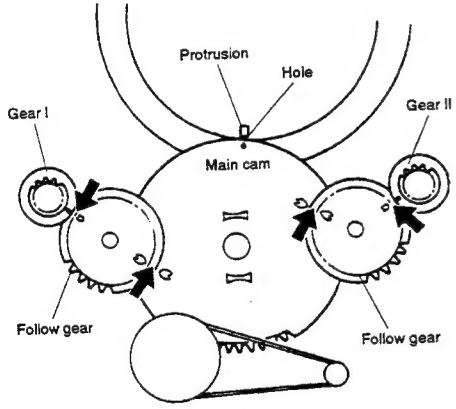


Fig. 2–6

2.5 MOUNTING OF CLAMPER ASSEMBLY

Mount the clamper assembly by aligning the protrusion portion as shown in the figure.

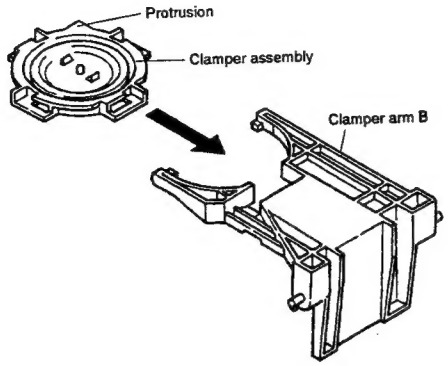


Fig. 2–7

PD-P730T

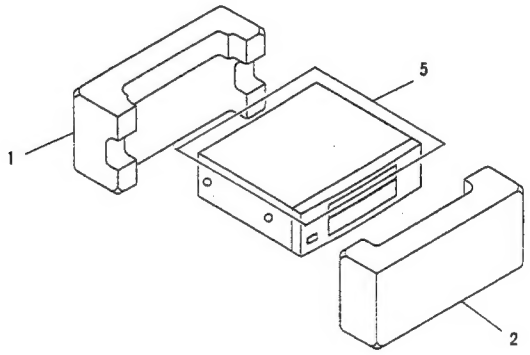
3. PACKING AND PARTS LIST

NOTES:

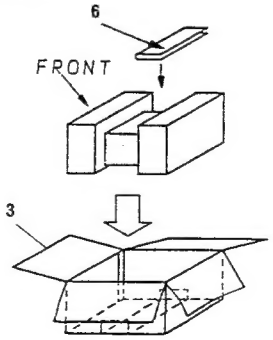
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

Mark	No.	Description	Part No.
	1	Protector (R)	PHA1223
	2	Protector (F)	PHA1218
	3	Packing case	PHG1853
	4	.....	
	5	Mirror mat sheet	Z23 – 026
	6	Operating instructions (English/French/ German/Italian/ Dutch/Swedish/ Spanish/Portuguese)	PRE1170



• AEMXJS, ABXJS type



• ADL type

Refer to the service manual ARP2682 for XS-P730M and XS-P730T.

4. EXPLODED VIEWS AND PARTS LIST

4.1 EXTERIOR

NOTES:

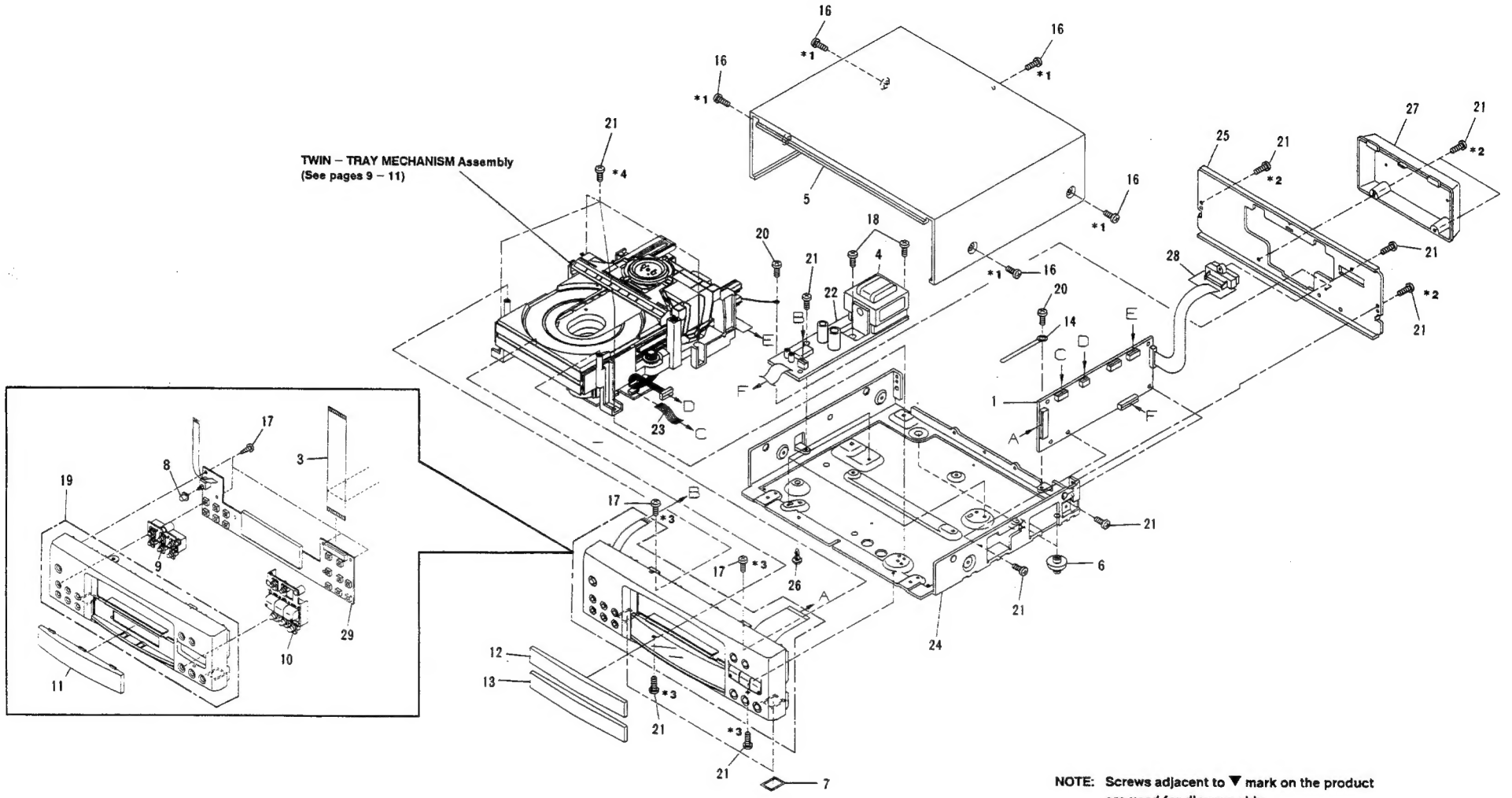
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

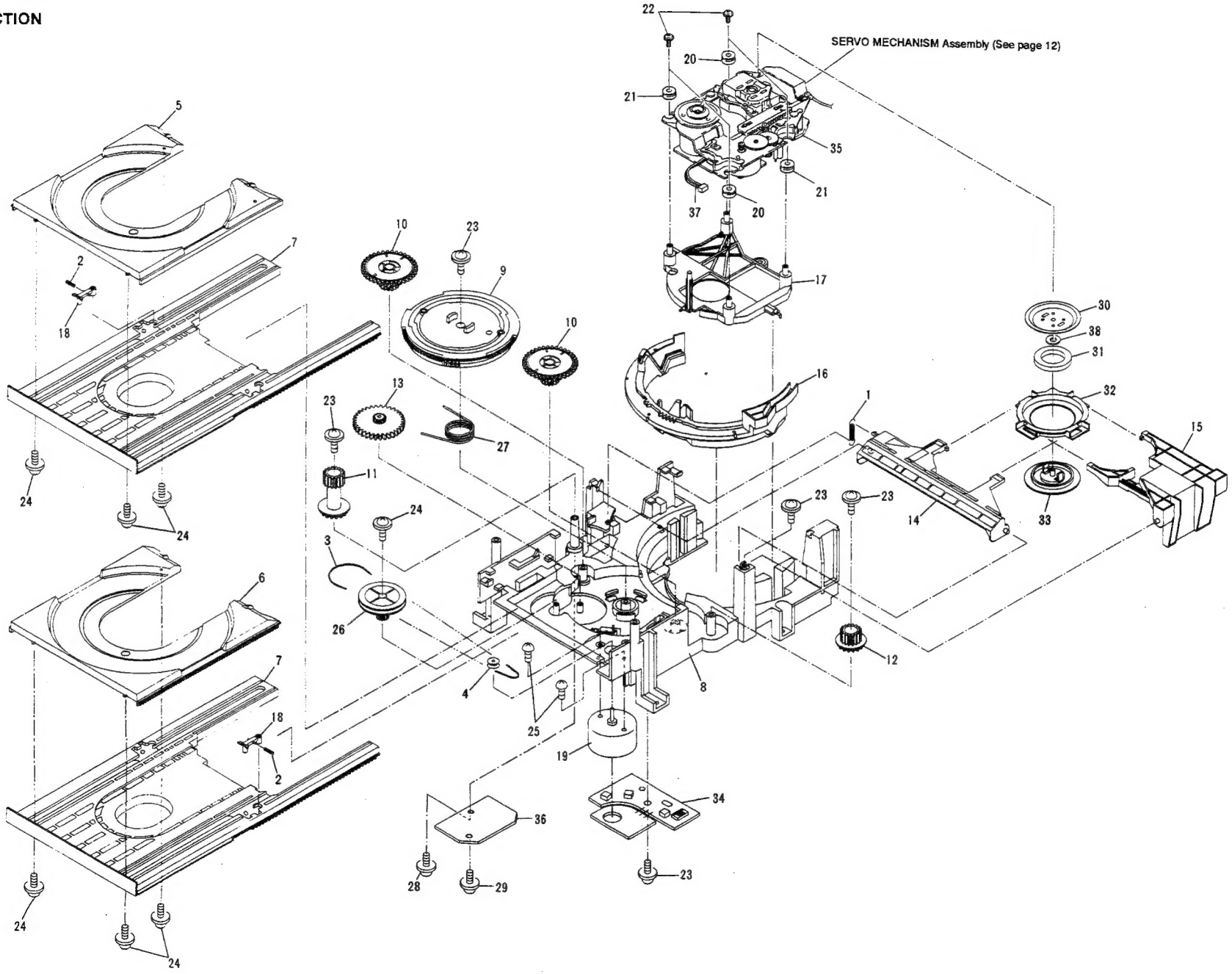
Mark	No.	Description	Part No.
	1	Mother board assembly	PWM1710
	2	.....	
	3	24P F•F•C/30V	PDD1113
⚠	4	Power transformer	PTT1279
	5	Bonnet	PNA1707
	6	Foot assembly	REC – 434
	7	Rubber Sheet	AEB1111
	8	Power button	PAC1693
	9	Mode button	PAC1696
	10	Operate button	PAC1698
	11	Display window	PAM1586
	12	Name plate 1	PNW2213
	13	Name plate 2	PNW2214
	14	Cord clamper	RNH – 184
NSP	15	Twin-tray mechanism	PXA1481
	16	Screw	BDZ30P060FZK
	17	Screw	PPZ30P100FMC
	18	Screw	PSA40P060FMC
	19	Operation panel	PNW2212
	20	Screw	PDZ30P050FMC
	21	Screw	BBZ30P080FZK
	22	Trans board assembly	PWZ2445
NSP	23	Jumper wire	D20PYY0515G
NSP	24	Under base	PNA1716
NSP	25	Rear base	PNA1889
NSP	26	PCB holder	PNW1861
NSP	27	Rear cap	PNW2127
	28	Connector board assembly	PWZ2446
	29	Function board assembly	PWZ2444

Exterior

Note: The numbers such as * 1 through * 4 are used in " 2. DISASSEMBLY ".



4.2 MECHANISM SECTION



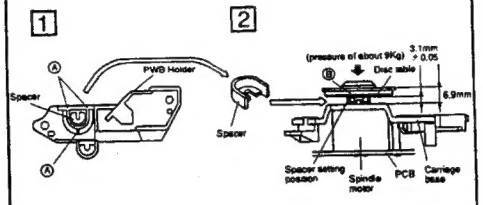
Parts List

Mark	No.	Description	Part No.
	1	Clamp spring	PBH1103
	2	Lever spring	PBH1104
	3	Belt	PEB1106
	4	Motor pulley	PNW1634
	5	Tray 1	PNW1839
	6	Tray 2	PNW1840
	7	Sub tray	PNW1841
	8	Loading base	PNW1842
	9	Main cam	PNW1843
	10	Follow gear	PNW1844
	11	Gear 1	PNW1845
	12	Gear 2	PNW1846
	13	Idler gear	PNW1847
	14	Clamper arm U	PNW1850
	15	Clamper arm B	PNW1851
	16	Clamp cam	PNW1852
	17	Float base	PNW2041
	18	Lock lever	PNW1854
	19	Motor (LOADING)	PXM1010
	20	Floating rubber	PEB1014
	21	Floating rubber	PEB1132
	22	Screw	PBA1048
	23	Screw	IPZ30P080FMC
	24	Screw	IPZ20P080FMC
	25	Screw	PMZ26P040FMC
	26	Gear pulley	PNW1848
	27	Push spring	PBH1105
	28	Screw	IPZ30P200FMC
	29	Screw	IPZ30P120FMC
NSP	30	Yoke	PNB1216
NSP	31	Clamper magnet	PMF1014
NSP	32	Clamper holder	PNW1849
NSP	33	Clamper S	PNW1609
NSP	34	Mechanism P.C.B assembly	PWX1145
NSP	35	Servo mechanism assembly	PXA1478
NSP	36	Sub plate	PNB1287
NSP	37	2mm pich connector assembly (4P)	PDE1146
NSP	38	H rubber	PEB1249

• How to install the disc table

[1] Use nipper or other tool to cut the three sections marked Ⓐ figure [1]. Then remove the spacer.

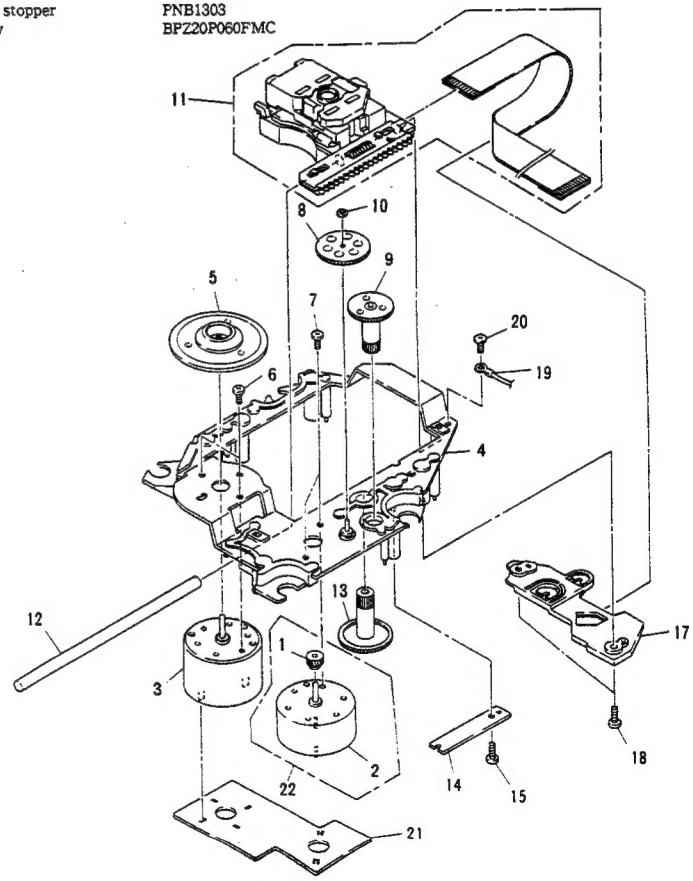
[2] While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section Ⓑ),and stick the disc table on top (takes about 9Kg pressure). Take off the spacer.



SERVO MECHANISM Assembly

Parts List

Mark	No.	Description	Part No.
	1	Pinion gear	PNW2055
	2	DC motor (CARRIAGE)	PXM1027
	3	DC motor assembly (SPINDLE)	PEA1235
	4	Carridge base	PNW2058
	5	Disc table	PNW1068
	6	Screw	JFZ20P030FNI
	7	Screw	JFZ17P025FZK
	8	Gear 3	PNW2054
	9	Gear 2	PNW2053
	10	Washer	WT12D032D025
	11	Pickup assembly	PEA1179
	12	Guide bar	PLA1094
	13	Gear 1	PNW2052
NSP	14	Gear stopper	PNB1303
	15	Screw	BPZ20P060FMC
	16	.....	
	17	PWB holder	PNW2057
	18	Screw	BPZ26P100FMC
NSP	19	Earth lead unit	PDF1104
	20	Screw	BBZ26P060FMC
NSP	21	Mechanism board assembly	PWX1192
	22	DC motor assembly	PEA1246



5. SCHEMATIC DIAGRAMS

Note: (Type 6)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ⎓ : DC voltage (V) in STOP mode unless otherwise noted.
   ⇦ mA or ⬅ mA : DC current in STOP mode unless otherwise noted.
7. **OTHERS:**
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SWITCHES** (Underline indicates switch position):

MOTHER BOARD ASSEMBLY
S351 : TEST MODE

FUNCTION BOARD ASSEMBLY
S701 : DISC 1 (DISC SELECT)
S702 : OPEN/CLOSE 1
S703 : OPEN/CLOSE 2
S704 : DISC 2 (DISC SELECT)
S705 : PLAY/PAUSE (▶/❚❚)
S706 : STOP (■)
S707 : MANUAL/TRACK SEARCH FWD (▶▶•▶▶|)
S708 : MANUAL/TRACK SEARCH REV (|◀◀•◀◀)
S709 : EDIT
S710 : PROGRAM
S711 : TIME
S712 : AUTO EJECT
S713 : REPEAT
S714 : RANDOM
S751 : POWER ON/OFF

MECHANISM PCB ASSEMBLY
S601 : TRY 1
S602 : TSEL
S603 : TRY 2

MECHANISM BOARD ASSEMBLY
S610 : INSIDE

● Terminal Voltages

(unit : V)

IC151
(CXA1372Q)

Pin No.	Voltage	Pin No.	Voltage
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	-0.2	29	0
6	0	30	N.C.
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	-1.5
11	0	35	-1.7
12	0	36	5
13	0	37	-0.7
14	0.2~0.8	38	-1.6
15	0	39	0
16	-4	40	0.6
17	1.3	41	-5
18	0	42	0
19	-5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0

IC20
(M5298P)

Pin No.	Voltage	Pin No.	Voltage
1	-8.7	9	5
2	N.C.	10	N.C.
3	-5	11	0.6
4	0.2	12	5
5	-8.7	13	8.2
6	-6.9	14	5
7	N.C.	15	1.2
8	N.C.	16	8.2

IC301
(CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage
1	5	41	N.C.
2	N.C.	42	5
3	5	43	N.C.
4	2.6	44	N.C.
5	N.C.	45	N.C.
6	5	46	4.4
7	N.C.	47	0
8	N.C.	48	0
9	0	49	0 - 0.3
10	0	50	N.C.
11	N.C.	51	N.C.
12	0	52	0
13	N.C.	53	2.5
14	N.C.	54	N.C.
15	N.C.	55	0
16	N.C.	56	N.C.
17	0	57	N.C.
18	2.5	58	N.C.
19	2.4	59	0
20	2.4	60	N.C.
21	0	61	N.C.
22	2.5	62	N.C.
23	5	63	0
24	2.5	64	N.C.
25	N.C.	65	0
26	0	66	3.3 -4.6
27	2.5	67	5
28	0	68	0
29	N.C.	69	2.1 -3
30	0	70	5
31	N.C.	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	N.C.	76	0
37	N.C.	77	5
38	N.C.	78	5
39	N.C.	79	5
40	N.C.	80	0

IC401
(TC9237BF)

Pin No.	Voltage	Pin No.	Voltage
1	5	15	0
2	0	16	1.9
3	5	17	1.9
4	5.5	18	5
5	2.5	19	2
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5
11	5	25	2.5
12	0	26	2.5
13	N.C.	27	2.5
14	0	28	5

IC351
(PD4435A)

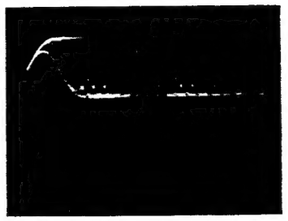
Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5.0	17	-16.6	33	4.9	49	0
2	N.C.	18	-26.0	34	3.9~4.2	50	N.C.
3	N.C.	19	-5.0	35	4.9	51	5.0
4	-22.3	20	-1.1	36	0	52	5.0
5	-22.3	21	-0.2~-1.9	37	4.9	53	5.0
6	-22.3	22	1.1~1.6	38	1.2~2.5	54	5.0
7	-22.3	23	1.0~1.5	39	0	55	0
8	-22.3	24	0.6~1.5	40	5.0	56	2.3
9	-22.3	25	0.7~1.2	41	N.C.	57	2.3
10	-22.3	26	5.0	42	0	58	0
11	-22.3	27	-1.0	43	5.0	59	0
12	0	28	-22.0	44	0	60	N.C.
13	0	29	-12~-18	45	5.0	61	5.0
14	N.C.	30	-0.3~-1.1	46	0	62	0
15	N.C.	31	0	47	0	63	5.0
16	-1.0	32	4.8	48	0	64	5.0

Waveforms

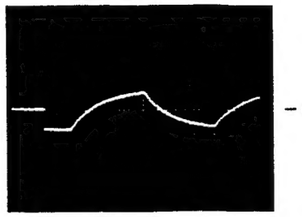
Note: The encircled numbers denote measuring points in the schematic diagram.

*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.

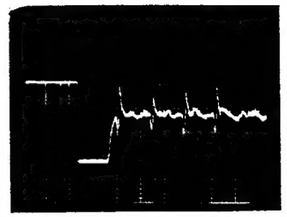
② TP1-Pin 1: PLAY MODE
(RF)
500mV/div 500nsec/div



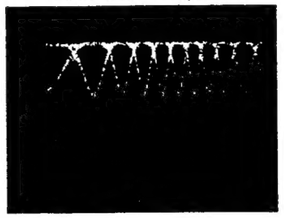
⑤ IC202-Pin 4: FOCUS-IN (*2) MODE
(FODR)
1V/div 200msec/div



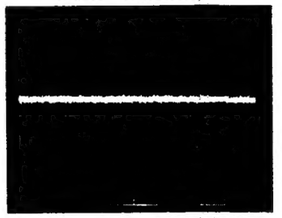
⑦ IC201-Pin 3: TRACK SEARCH MODE
(SPDR)
2V/div 50msec/div



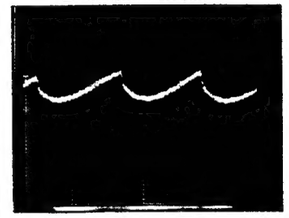
② TP1-Pin 1: TRACK SEARCH MODE
(RF)
500mV/div 200μsec/div



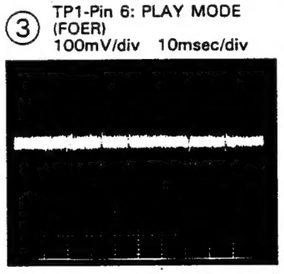
⑤ IC202-Pin 4: PLAY MODE
(FODR)
1V/div 1msec/div



⑧ IC202-Pin 9: PLAY MODE
(CADR)
200mV/div 2sec/div

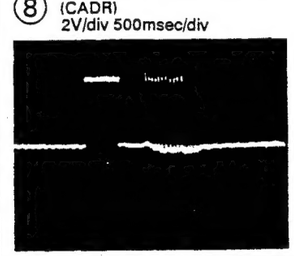


③ TP1-Pin 6: PLAY MODE
(FOER)
100mV/div 10msec/div

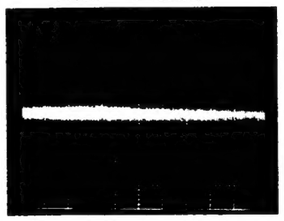


⑥ IC202-Pin 3: PLAY MODE
(TRDR)
500mV/div 1msec/div

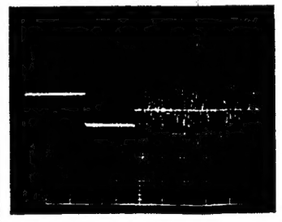
⑧ IC202-Pin 9: TRACK SEARCH MODE
(CADR)
2V/div 500msec/div



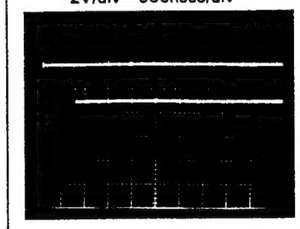
④ TP1-Pin 2: PLAY MODE
(TRER)
1V/div 10msec/div



⑥ IC202-Pin 3: 50T-JUMP (*1) MODE
(TRDR)
500mV/div 1msec/div

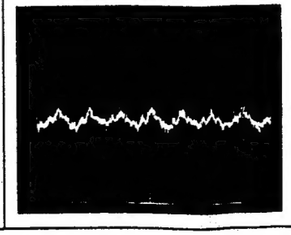


⑨ IC151-Pin 32: PLAY MODE
(EFM)
2V/div 500nsec/div

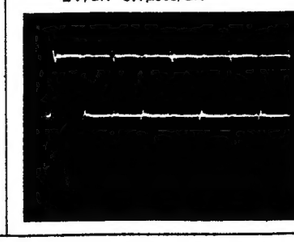


④ TP1-Pin 2: 50T-JUMP (*1) MODE
(TRER)
1V/div 1msec/div

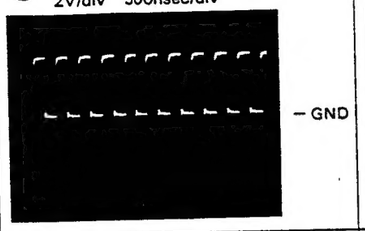
⑦ IC201-Pin 3: PLAY MODE
(SPDR)
1V/div 50msec/div



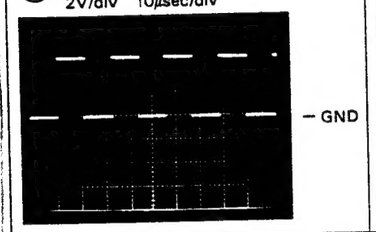
⑩ IC401-Pin 9: PLAY MODE
(D/A DATA OUT)
2V/div 0.1μsec/div



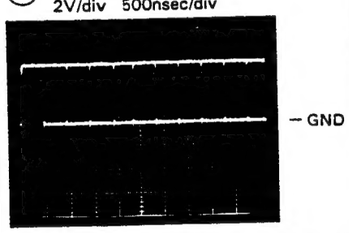
⑯ IC301-Pin 35: PLAY MODE (1kHz)
(BCLK)
2V/div 500nsec/div



⑱ IC301-Pin 32: PLAY MODE (1kHz)
(LRCK)
2V/div 10μsec/div

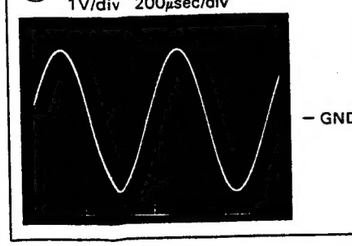


⑲ IC301-Pin 34: PLAY MODE (1kHz)
(DATA)
2V/div 500nsec/div



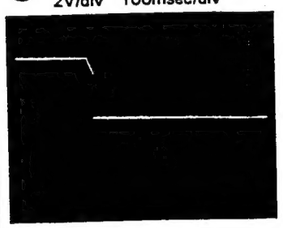
⑳

㉑ CN381-Pin 1: PLAY MODE (1kHz)
(L ch OUTPUT)
1V/div 200μsec/div

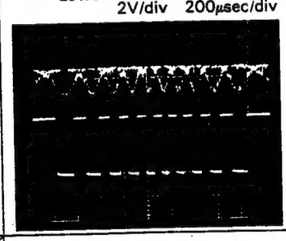


㉒ IC20-Pin 9: POWER SWITCH-ON
(RST)
2V/div 100msec/div

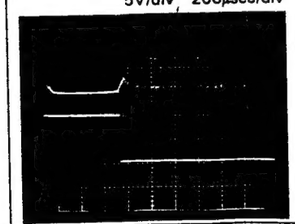
㉒ IC20-Pin 9: POWER SWITCH-OFF
(RST)
2V/div 100msec/div



㉓ : TRACK SEARCH MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 29 (MIRR)
2V/div 200μsec/div



㉔ : PLAY MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 30 (DFCT)
5V/div 200μsec/div



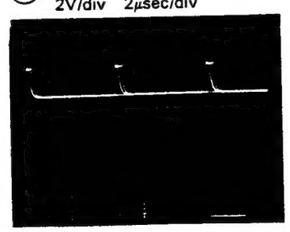
㉕

㉖

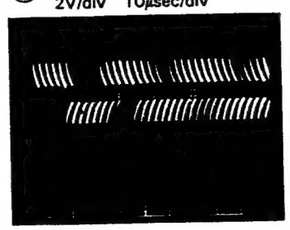
㉗

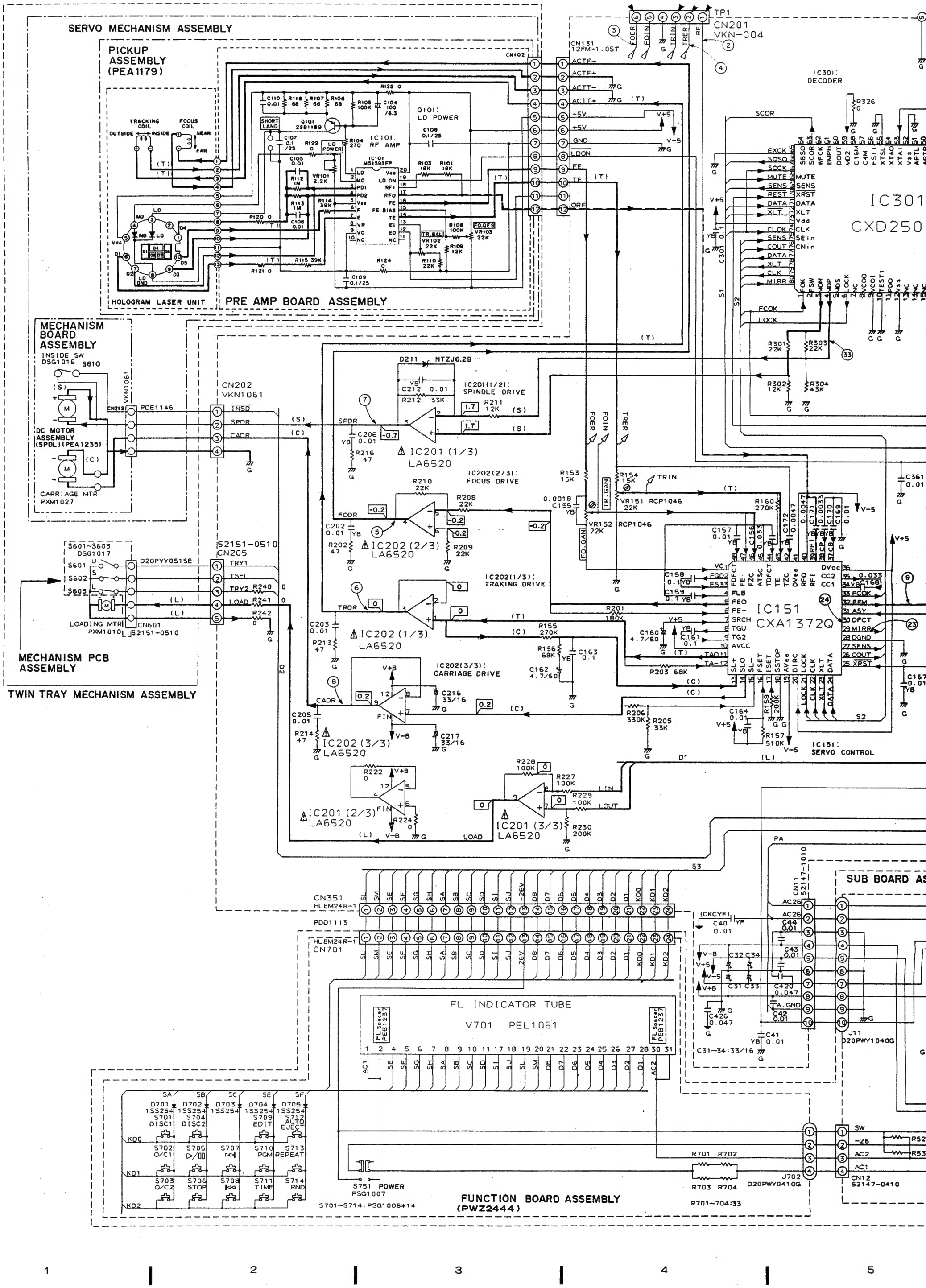
㉘

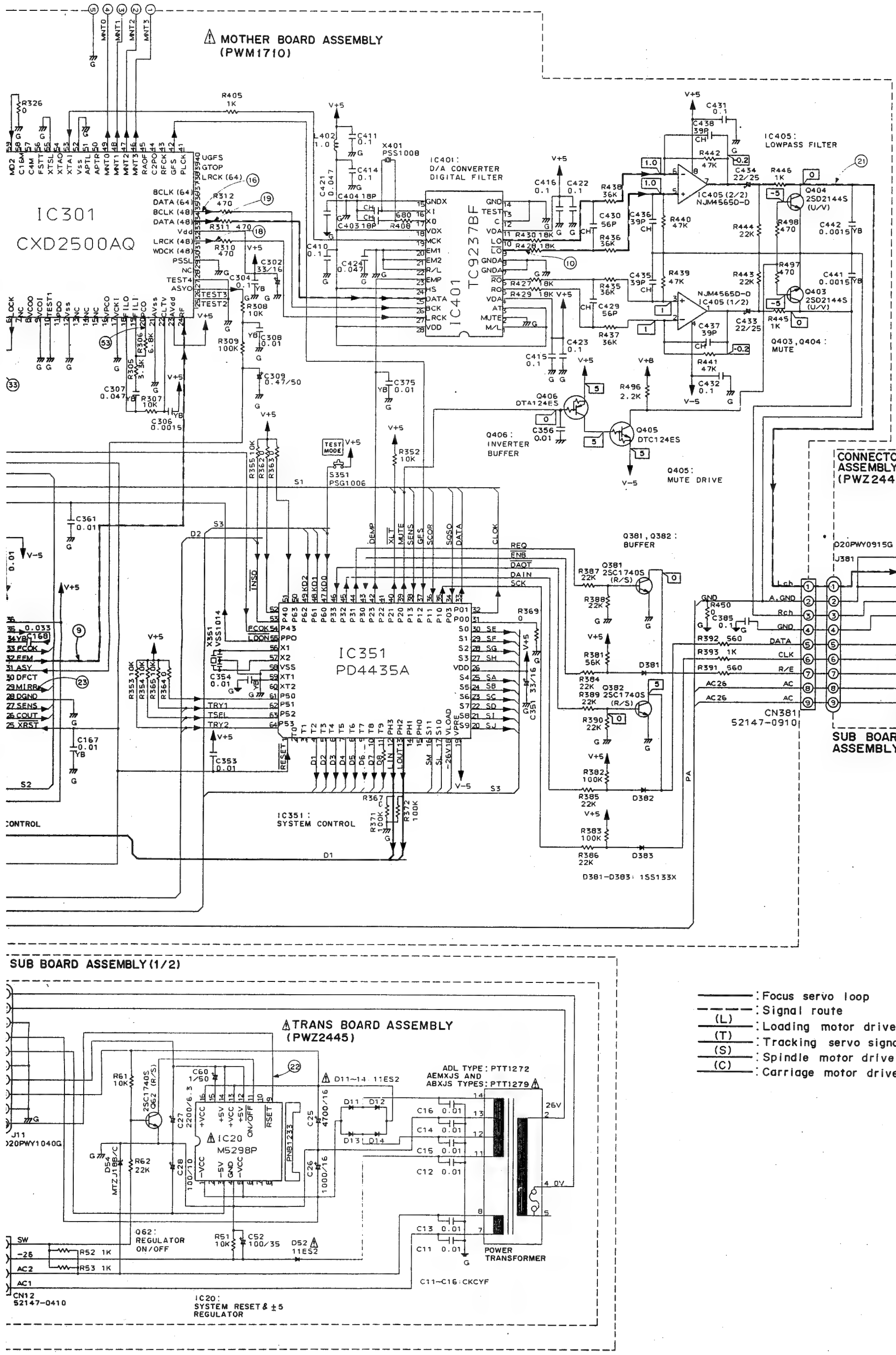
㉝ IC301-Pin 4: PLAY MODE
(MDP)
2V/div 2μsec/div



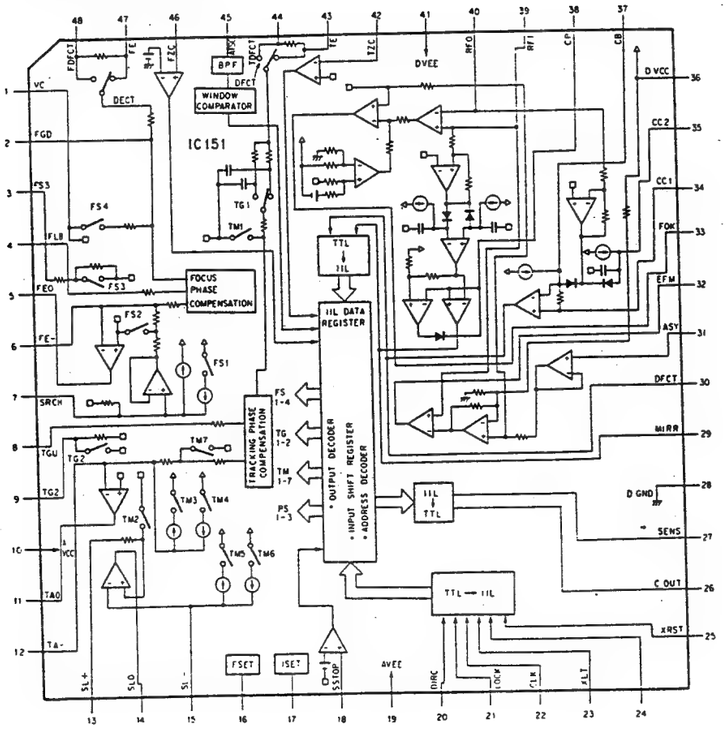
㊸ IC301-Pin 20: PLAY MODE
(PCO)
2V/div 10μsec/div



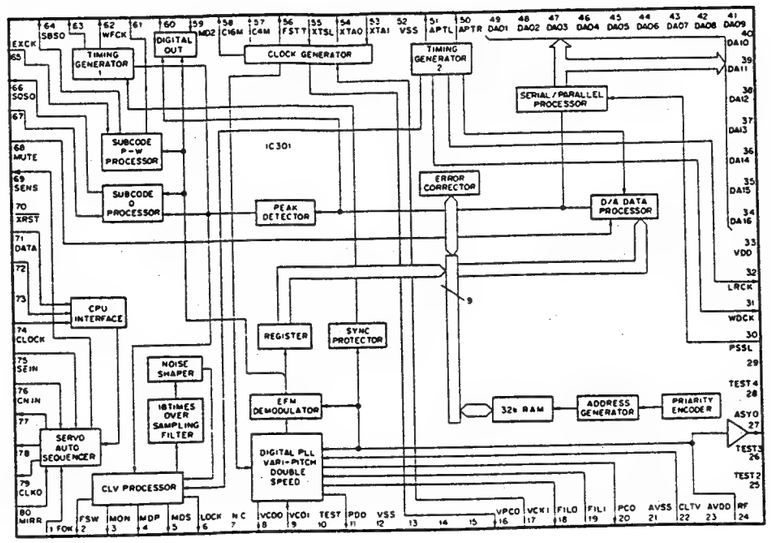

SERVO MECHANISM ASSEMBLY
PICKUP ASSEMBLY (PEA1179)
TRACKING COIL
FOCUS COIL
OUTSIDE
INSIDE
NEAR
FAR
HOLOGRAM LASER UNIT
PRE AMP BOARD ASSEMBLY
CN102
CN131 12FM-1.0ST
TP1
CN201 VKN-004
Q101: LD POWER
Q101 2SB1189
IC101: RF AMP
IC101 M51593FP
IC301: DECODER
IC301
CXD250
IC151 CXA1372Q
IC151: SERVO CONTROL
MECHANISM BOARD ASSEMBLY
INSIDE SW DSG1016 S610
DC MOTOR ASSEMBLY (SPDL) (PEA1235)
CARRIAGE MTR PXM1027
CN212
PDE1146
VKN1061
CN202 VKN1061
S601~S603 DSG1017
LOADING MTR PXM1010
CN601
52151-0510
CN205
MECHANISM PCB ASSEMBLY
TWIN TRAY MECHANISM ASSEMBLY
D211 NTZJ6.2B
IC201(1/2): SPINDLE DRIVE
IC201 (1/3) LA6520
IC202(2/3): FOCUS DRIVE
IC202 (2/3) LA6520
IC202(1/3): TRAKING DRIVE
IC202 (1/3) LA6520
IC202(3/3): CARRIAGE DRIVE
IC202 (3/3) LA6520
IC201 (2/3) LA6520
IC201 (3/3) LA6520
CN351 HLEM24R-1
PDD1113
CN701
FL INDICATOR TUBE
V701 PEL1061
S751 POWER PSG1007
S701~S714: PSG1006*14
FUNCTION BOARD ASSEMBLY (PWZ2444)
R701~704:33
SUB BOARD AS
J11 D20PWY1040G
J702 D20PWY0410G
CN12 52147-0410
CN11 52147-1010


⚠ MOTHER BOARD ASSEMBLY
(PWM1710)
IC301
CXD2500AQ
IC401
TC9237BF
IC401:
D/A CONVERTER
DIGITAL FILTER
IC405:
LOWPASS FILTER
IC405(2/2)
NJM4565D-D
IC405(1/2)
NJM4565D-D
Q403,Q404:
MUTE
Q404
2SD2144S
(U/V)
Q403
2SD2144S
(U/V)
Q406:
INVERTER
BUFFER
DTA124ES
Q405
DTC124ES
Q405:
MUTE DRIVE
IC351
PD4435A
IC351:
SYSTEM CONTROL
Q381,Q382:
BUFFER
2SC1740S
(R/S)
D381-D383: 1SS133X
CONNECTOR BOARD
ASSEMBLY
(PWZ2446)
D20PWY0915G
J381
TO AMPLIFIER
CN381
52147-0910
CN380
AKP1090
SUB BOARD
ASSEMBLY(2/2)
SUB BOARD ASSEMBLY(1/2)
⚠TRANS BOARD ASSEMBLY
(PWZ2445)
ADL TYPE: PTT1272
AEMXJS AND
ABXJS TYPES: PTT1279
IC20
M5298P
IC20:
SYSTEM RESET & ±5
REGULATOR
Q62:
REGULATOR
ON/OFF
POWER
TRANSFORMER
CN12
52147-0410
C11~C16: CKCYF
D11~14: 11ES2
S351
PSG1006
X401
PSS1008
: Focus servo loop
: Signal route
(L) : Loading motor drive signal
(T) : Tracking servo signal
(S) : Spindle motor drive signal
(C) : Carriage motor drive signal

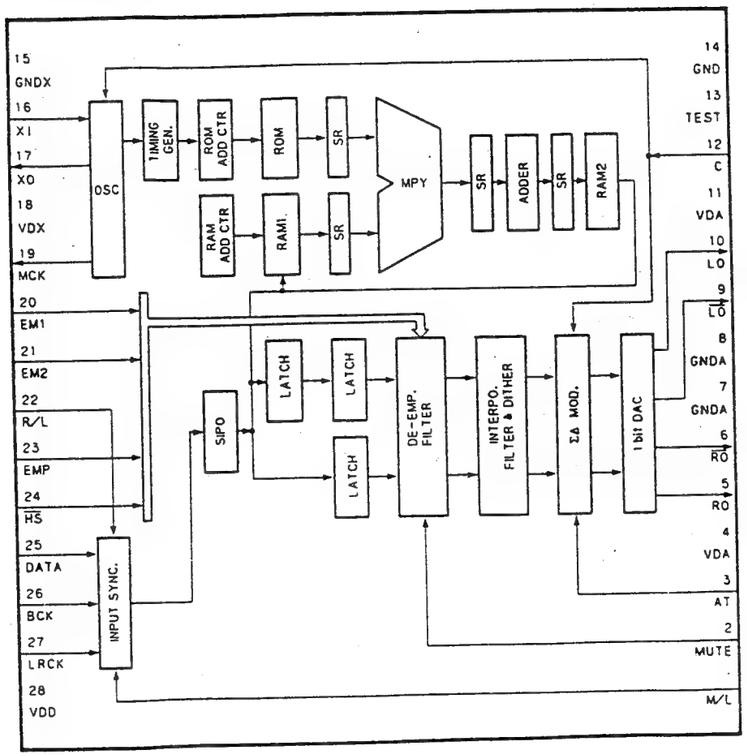
IC151 : CXA1372Q



IC301 : CXD2500AQ



IC401 : TC9237BF



6. PCB CONNECTION DIAGRAMS

- View from component side

IC301 (CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5.0	21	0	41	NC	61	NC
2	NC	22	2.5	42	5.0	62	NC
3	5.0	23	5.0	43	NC	63	0
4	2.6	24	2.5	44	NC	64	NC
5	NC	25	NC	45	NC	65	0
6	5.0	26	0	46	4.4	66	1.1 to 4.5
7	NC	27	2.5	47	0	67	5.0
8	NC	28	0	48	0	68	0
9	0	29	NC	49	2 to 3.3	69	2.1 to 3.9
10	0	30	0	50	NC	70	5.0
11	NC	31	NC	51	NC	71	5.0
12	0	32	2.5	52	0	72	5.0
13	NC	33	5.0	53	2.5	73	5.0
14	NC	34	2.5	54	NC	74	5.0
15	NC	35	2.5	55	0	75	5.0
16	NC	36	NC	56	NC	76	0
17	0	37	NC	57	NC	77	5.0
18	2.5	38	NC	58	NC	78	5.0
19	2.4	39	NC	59	0	79	5.0
20	2.4	40	NC	60	NC	80	0

IC151 (CXA1372Q)

Pin No.	Voltage	Pin No.	Voltage
1	0	25	5.0
2	0	26	0
3	0	27	5.0
4	0	28	0
5	-0.2	29	0
6	0	30	NC
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5.0
10	5.0	34	-1.5
11	0	35	-1.7
12	0	36	5.0
13	0	37	-0.7
14	0.1 to 0.3	38	-1.8
15	0	39	0
16	-4.0	40	0.8
17	1.3	41	-5.0
18	0	42	0
19	-5.0	43	0
20	5.0	44	0
21	5.0	45	0
22	5.0	46	0
23	5.0	47	0
24	5.0	48	0

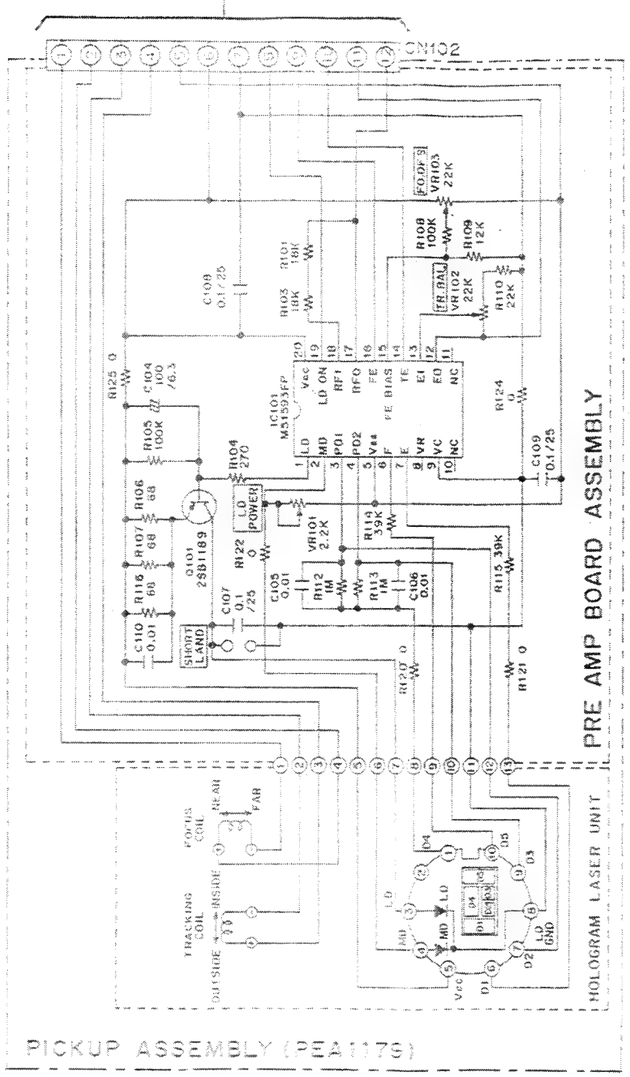
IC401 (TC92378F)

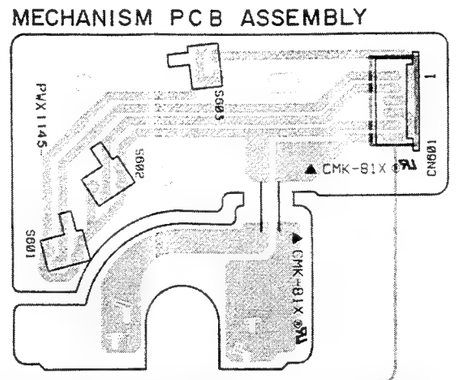
Pin No.	Voltage	Pin No.	Voltage
1	5.0	15	0
2	0	16	1.9
3	5.0	17	1.9
4	5.5	18	5.0
5	2.5	19	2.0
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5.0
11	5.0	25	2.5
12	0	26	2.5
13	NC	27	2.5
14	0	28	5.0

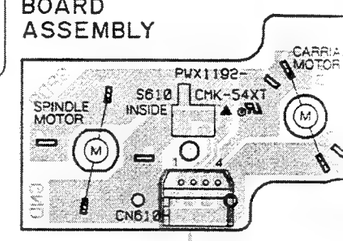
IC351 (PD4435A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5.0	17	-16.6	33	4.9	49	0
2	NC	18	-26.0	34	1.6 to 4.3	50	NC
3	NC	19	-5.0	35	4.8	51	5.0
4	-22.3	20	-1.1	36	0	52	5.0
5	-22.3	21	-8.2 to -1.9	37	4.9	53	5.0
6	-22.3	22	1.1 to 1.5	38	1.1 to 2.5	54	5.0
7	-22.3	23	1.6 to 1.9	39	0	55	0
8	-22.3	24	0.6 to 1.5	40	5.0	56	2.3
9	-22.3	25	0.7 to 1.1	41	NC	57	2.3
10	-22.3	26	5.0	42	0	58	0
11	-22.3	27	-1.0	43	5.0	59	0
12	0	28	-22.0	44	0	60	5.0
13	0	29	-12 to -18	45	5.0	61	NC
14	NC	30	-1.3 to -1.1	46	0	62	0
15	NC	31	0	47	0	63	5.0
16	-1.0	32	4.8	48	0	64	5.0

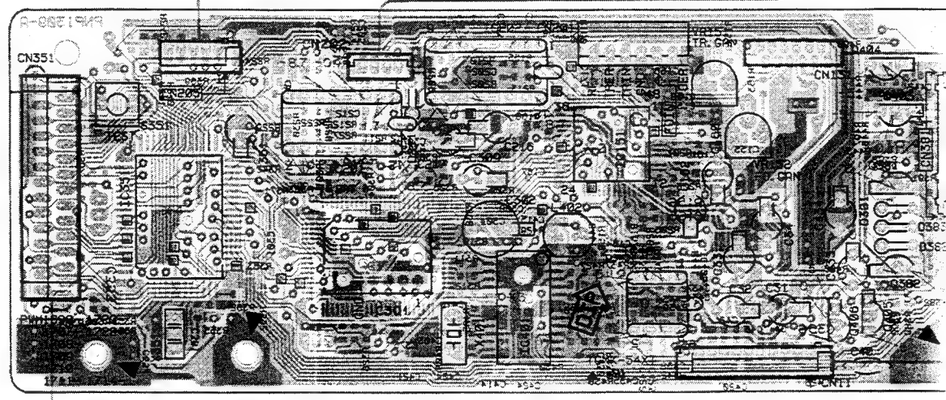
(Unit:V)



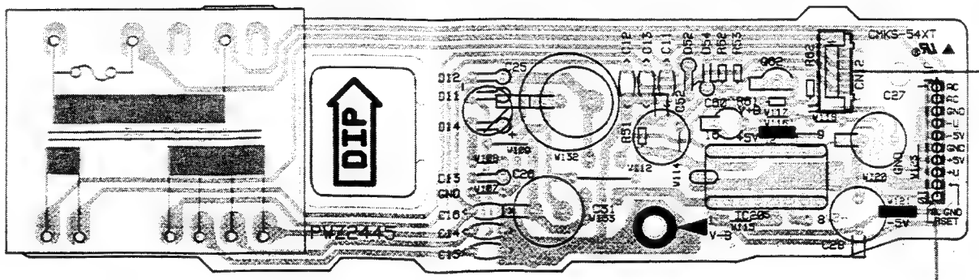




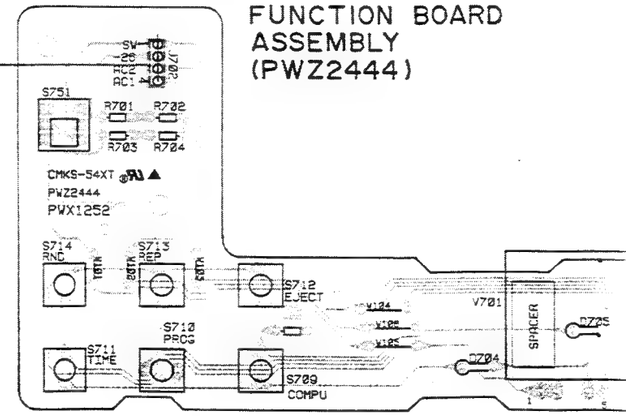
MOTHER BOARD ASSEMBLY (PWM1710)



TRANS BOARD ASSEMBLY (PWZ2445)



FUNCTION BOARD ASSEMBLY (PWZ2444)



MECHANISM PCB ASSEMBLY

MECHANISM BOARD ASSEMBLY

MOTHER BOARD ASSEMBLY (PWM1710)

CONNECTOR BOARD ASSEMBLY (PWZ2446)

TO AMPLIFIER

PRE AMP BOARD ASSEMBLY

HOLOGRAM LASER UNIT

ASSEMBLY (PEA1179)

ASSEMBLY (PWZ2445)

FUNCTION BOARD ASSEMBLY (PWZ2444)

P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
					Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Nonselesa)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-Fixed resistor
		Tact switch			Resistor array
		Inductor			Resistor
		Coil			Resonator
		Transformer			Thermistor
		Filter			

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

VR151

VR152

IC202

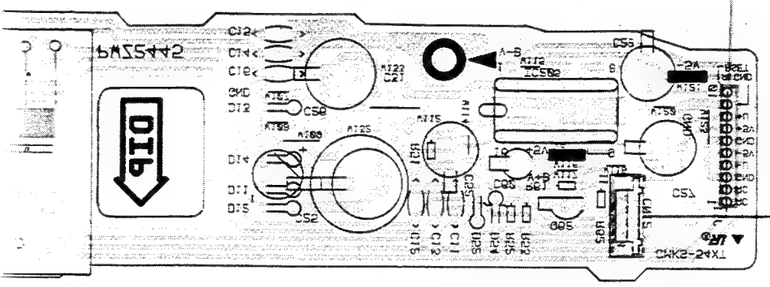
IC351 IC201 IC151

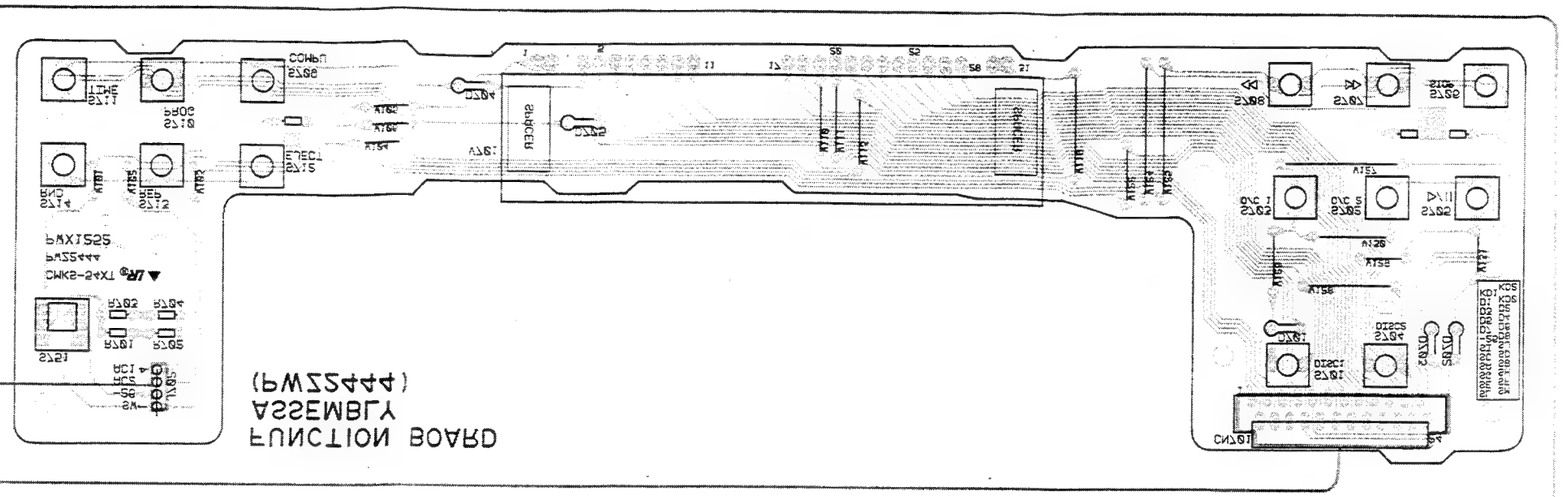
IC301

IC401 IC405

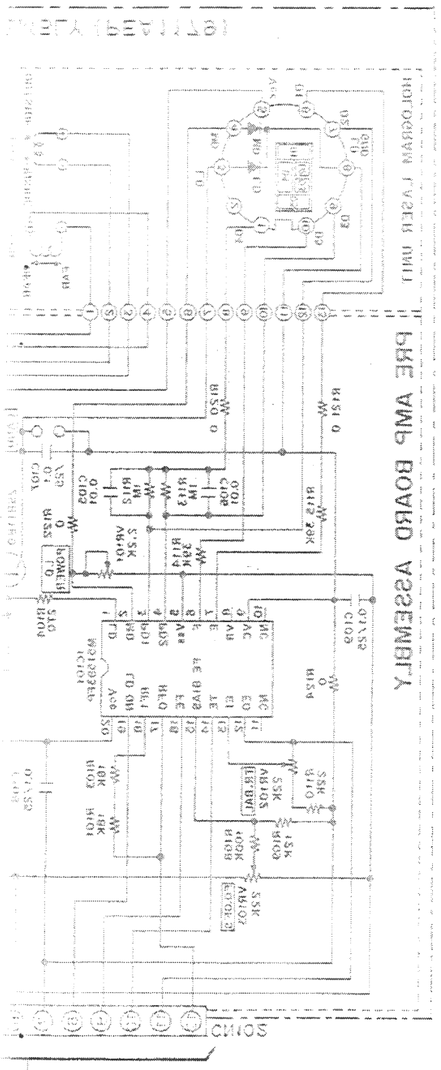
Q404 Q403 Q381 Q382 Q406 Q405

ASSEMBLY (PWZ5444)

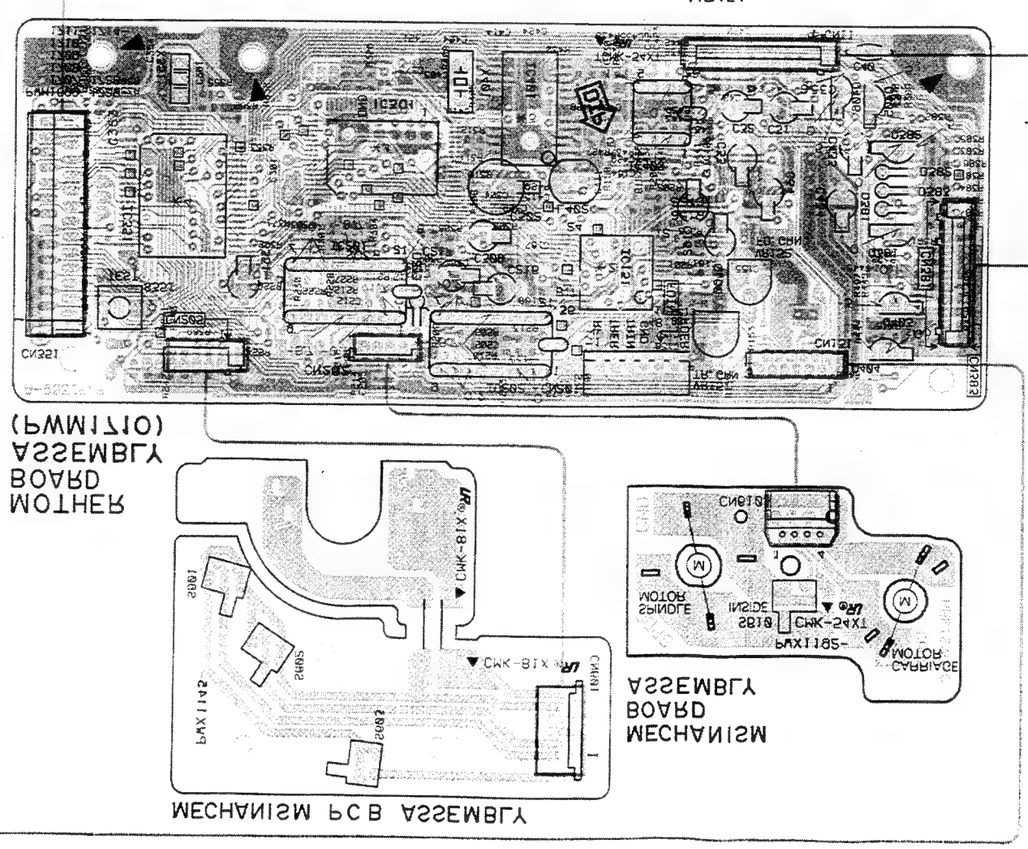




FUNCTION BOARD ASSEMBLY (PWZ5444)



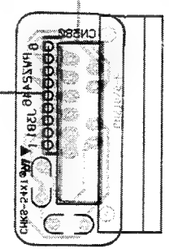
PRE AMP BOARD ASSEMBLY



MOTHER BOARD (PWM1710)

MECHANISM PCB ASSEMBLY

MECHANISM BOARD ASSEMBLY

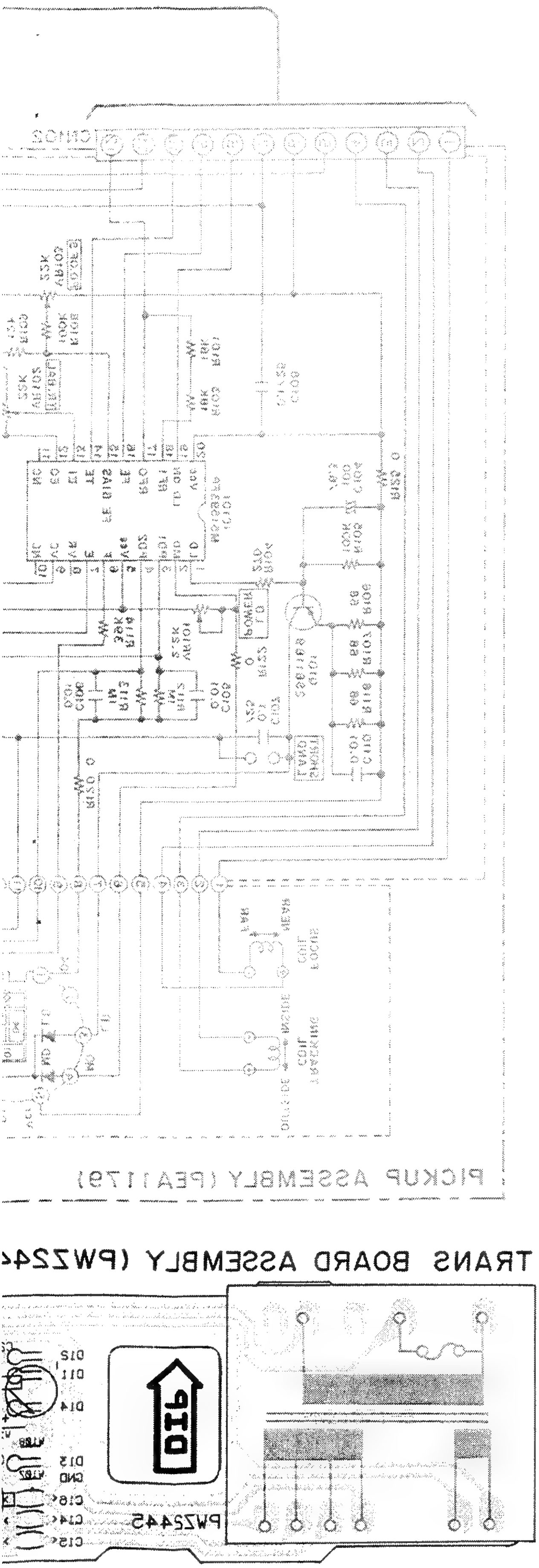


TO AMPLIFIER

CONNECTOR BOARD ASSEMBLY (PWZ5444)

6. PCB CONNECTION DIAGRAMS

- View from soldering side



IC151 (CXA1372Q)

Pin No.	Voltage	Pin No.	Voltage
1	0	25	5.0
2	0	26	0
3	0	27	5.0
4	0	28	0
5	-0.2	29	0
6	0	30	NC
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5.0
10	5.0	34	-1.5
11	0	35	-1.7
12	0	36	5.0
13	0	37	-0.7
14	0.2 to 0.7	38	-1.8
15	0	39	0
16	-4.0	40	0.8
17	1.3	41	-5.0
18	0	42	0
19	-5.0	43	0
20	5.0	44	0
21	5.0	45	0
22	5.0	46	0
23	5.0	47	0
24	5.0	48	0

IC301 (CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5.0	21	0	41	NC	61	NC
2	NC	22	2.5	42	5.0	62	NC
3	5.0	23	5.0	43	NC	63	0
4	2.6	24	2.5	44	NC	64	NC
5	NC	25	NC	45	NC	65	0
6	5.0	26	0	46	4.4	66	1.1 to 4.6
7	NC	27	2.5	47	0	67	5.0
8	NC	28	0	48	0	68	0
9	0	29	NC	49	0 to 0.3	69	2.1 to 3.0
10	0	30	0	50	NC	70	5.0
11	NC	31	NC	51	NC	71	5.0
12	0	32	2.5	52	0	72	5.0
13	NC	33	5.0	53	2.5	73	5.0
14	NC	34	2.5	54	NC	74	5.0
15	NC	35	2.5	55	0	75	5.0
16	NC	36	NC	56	NC	76	0
17	0	37	NC	57	NC	77	5.0
18	2.5	38	NC	58	NC	78	5.0
19	2.4	39	NC	59	0	79	5.0
20	2.4	40	NC	60	NC	80	0

IC351 (PD4435A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5.0	17	-16.6	33	4.9	49	0
2	NC	18	-26.0	34	3.3 to 4.2	50	NC
3	NC	19	-5.0	35	4.5	51	5.0
4	-22.3	20	-1.1	36	0	52	5.0
5	-22.3	21	-4.2 to -1.5	37	4.9	53	5.0
6	-22.3	22	1.1 to 1.6	38	1.2 to 1.9	54	5.0
7	-22.3	23	1.0 to 1.3	39	0	55	0
8	-22.3	24	0.5 to 1.5	40	5.0	56	2.3
9	-22.3	25	0.1 to 1.2	41	NC	57	2.3
10	-22.3	26	5.0	42	0	58	0
11	-22.3	27	-1.0	43	5.0	59	0
12	0	28	-22.0	44	0	60	5.0
13	0	29	-12 to -18	45	5.0	61	NC
14	NC	30	-4.3 to -1.1	46	0	62	0
15	NC	31	0	47	0	63	5.0
16	-1.0	32	4.8	48	0	64	5.0

(Unit:V)

IC401 (TC9237BF)

Pin No.	Voltage	Pin No.	Voltage
1	5.0	15	0
2	0	16	1.9
3	5.0	17	1.8
4	5.5	18	5.0
5	2.5	19	2.0
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5.0
11	5.0	25	2.5
12	0	26	2.5
13	NC	27	2.5
14	0	28	5.0

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7. PCB PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10¹ → 561 ..... RD1/8PM 5 6 1 J
47k Ω → 47 × 10³ → 473 ..... RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ..... RN2H 0 R 5 K
1 Ω → 010 ..... RS1P 0 1 0 K

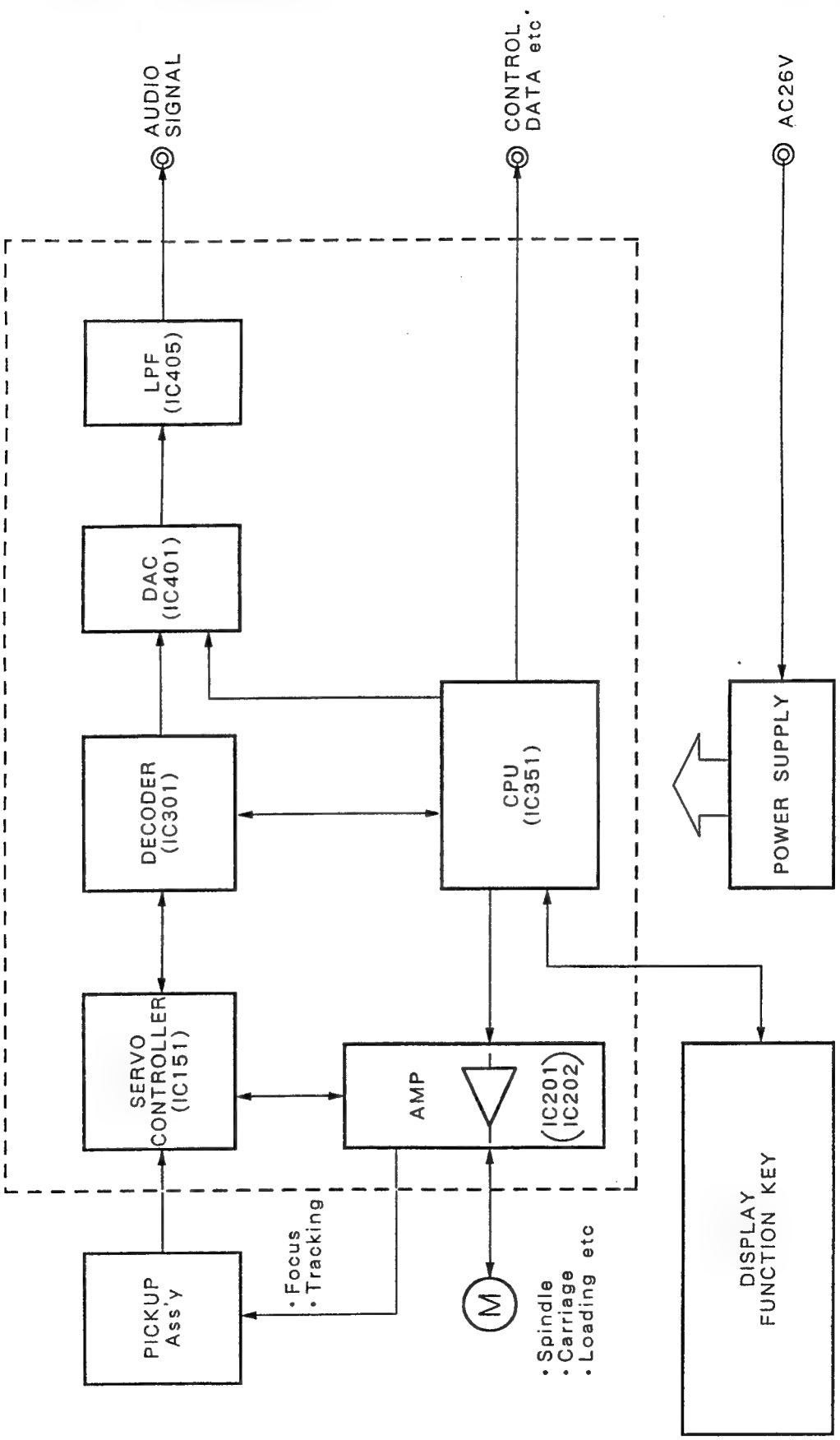
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ..... RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.
		LIST OF ASSEMBLY	
		MOTHER BOARD ASSEMBLY	PWM1710
		FUNCTION BOARD ASSEMBLY	PWZ2444
		TRANS BOARD ASSEMBLY	PWZ2445
		CONNECTOR BOARD ASSEMBLY	PWZ2446
NSP		MECHANISM PCB ASSEMBLY	PWX1145
NSP		MECHANISM BOARD ASSEMBLY	PWX1192
		MOTHER BOARD ASSEMBLY	
		SEMICONDUCTORS	
	IC151		CXA1372Q
	IC301		CXD2500AQ
⚠	IC201, IC202		LA6520
	IC405		NJM4565D-D
	IC351		PD4435A
	IC401		TC9237BF
	Q381, Q382		2SC1740S
	Q403, Q404		2SD2144S
	Q406		DTA124ES
	Q405		DTC124ES
	D381-D383		1SS133X
	D211		MTZJ6.2B
		SWITCHES	
	S351		PSG1006
		COILS	
	L402		LFA010K
		CAPACITORS	
	C403, C404		CCSQCH180J50
	C435-C438		CCSQCH390J50
	C429, C430		CCSQCH560J50
	C433, C434		CEJA220M2S
	C31-C34, C216, C217, C302, C351		CEJA330M16
	C160, C162		CEJA4R7M50
	C309		CEJAR47M50
	C40		CKCYF103Z50
	C41, C157, C164, C167, C169, C202, C206, C212, C308, C354, C375		CKSQYB103K50
	C158, C159, C161, C163, C301, C304,		CKSQYB104K25
	C306, C441, C442		CKSQYB152K50
	C155		CKSQYB182K50
	C170		CKSQYB332K50
	C156, C168		CKSQYB333K25
	C171, C172		CKSQYB472K50
	C307		CKSQYB473K25
	C42-C44, C203, C205, C353, C356, C361		CKSQYF103Z50
	C385, C410, C411, C414-C416, , C422,		CKSQYF104Z25
	C423, C431, C432		
	C420, C421, C424, C426		CKSQYF473Z25
		RESISTORS	
	VR151 (R=22K , W= 0.1)		RCP1046
	R222, R224, R240-R242, R326, R362-R364, R367, R369, R450		RS1/10S000J
	OTHER RESISTORS		RS1/10S□□□J
		OTHERS	
	CN131 FFC CONNECTOR 12P		12FM-1.0ST
	CN351 FFC CONNECTOR 24P		HLEM24R
	X401 CRYSTAL RESONATOR (16.9344MHZz)		PSS1008
	X351 CERAMIC RESONATOR(4.19MHz)		VSS1014
		MECANISM PCB ASSEMBLY	
		SWITCHES	
	S601-S603		DSG1017
		FUNCTION BOARD ASSEMBLY	
		SEMICONDUCTORS	
	D701-D705		1SS254
		SWITCHES	
	S701-S714		PSG1006
	S751		PSG1007
		RESISTORS	
	ALL RESISTORS		RD1/6PM□□□J
		OTHERS	
	CN701 FFC CONNECTOR 24P		HLEM24R

Mark	No.	Description	Part No.
	V701	FL INDICATOR TUBE	PEL1061
		TRANS BOARD ASSEMBLY	
		SEMICONDUCTORS	
⚠	IC20		M5298P
	Q62		2SC1740S
⚠	D11-D14, D52		11ES2
	D54		MTZJ18B
		CAPACITORS	
	C60		CEAS010M50
	C28		CEAS101M10
	C52		CEAS101M35
	C26		CEAS102M16
	C27		CEAS222M6R3
	C25		CEAS472M16
	C11-C16		CKCYF103Z50
		RESISTORS	
	ALL RESISTORS		RD1/6PM□□□J
		CONNECTOR BOARD ASSEMBLY	
		OTHERS	
	SOCKET 15P		AKP1090
		MECHANISM BOARD ASSEMBLY	
		SWITCHES	
	S610		DSG1016

8. BLOCK DIAGRAM



9. ADJUSTMENTS

1. Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

1-1 Adjustment items/verification items and order

If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in steps 1–4, the pickup block may be defective.

Step	Item	Test point	Adjustment location
1	Focus offset verification	TP1, Pin 6 (FCS. ERR)	None
2	Tracking error balance verification	TP1, Pin 2 (TRK. ERR)	None
3	Pickup radial/tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw. Tangential tilt adjustment screw
4	RF level verification	TP1, Pin 1 (RF)	None
5	Focus servo loop gain adjustment	TP1, Pin 5 (FCS. IN) TP1, Pin 6 (FCS. ERR)	VR152 (FCS. GAN)
6	Tracking servo loop gain adjustment	TP1, Pin 3 (TRK. IN) TP1, Pin 2 (TRK. ERR)	VR151 (TRK. GAN)

● **Abbreviation table**

FCS. ERR : Focus Error
TRK. ERR : Tracking Error
FCS. GAN : Focus Gain
TRK. GAN : Tracking Gain
FCS. IN : Focus In
TRK. IN : Tracking In

1-2 Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 8-cm disc (with about 20 minutes of recording)
5. Low-pass filter (39 kΩ + 0.001 μF)
6. Resistor (100 kΩ)
7. Ball point hexagon wrench (size: 1.5 mm) GGK1002
8. Standard tools

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1-3 Test point and adjustment variable resistor positions

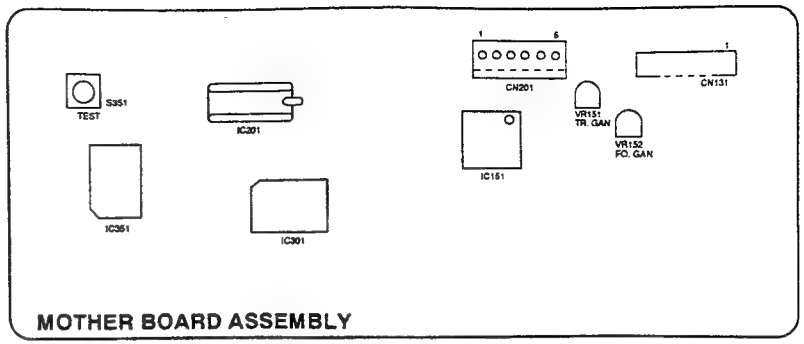


Figure 1 Adjustment Locations

1-4 Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

1-5 Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.
1. Turn off the power switch.
2. Press the switch (S351) for test mode on the MAIN BOARD ASSEMBLY.
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1-3.

[Release from test mode]

Here is the procedure for releasing the test mode:
1. Press the STOP key to stop all operations.
2. Turn off the power switch on the front panel.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	PGM (PROGRAM)	Focus servo close	If Disc Tray 1 is closed, Disk Tray 1 is moved to the play position. Then the laser diode is lit up and the focus actuator is lowered, then raised slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down, then the actuator is raised and lowered three times and returned to its original position.
▶/❚❚	PLAY/PAUSE	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom occurs.
▶/❚❚	PLAY/PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.
⏮/◀◀	MANUAL/ TRACK SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
▶▶/⏭	MANUAL/ TRACK SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
■	STOP	Stop	Switches off all the servos and initializes. The pickup remains where it was when this key was pressed.
▲	OPEN/CLOSE DISC 1	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key and open/close tray alternately.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

PGM (PROGRAM) — Lights up the laser diode and closes the focus servo.

⇩

PLAY/PAUSE ▶/❚❚ — Starts the spindle motor and closes the spindle servo.

⇩

PLAY/PAUSE ▶/❚❚ — Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus Offset Adjustment

● Objective ● Symptom when out of adjustment	Verify the DC offset for the focus error amp. The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS. ERR). [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) None None needed
[Procedure] Verify the DC voltage at TP1, Pin 6 (FCS. ERR) is 0 ± 50 mV.			

Note: If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in adjustment items 1–4, the pickup block may be defective.

2. Tracking Error Balance Adjustment

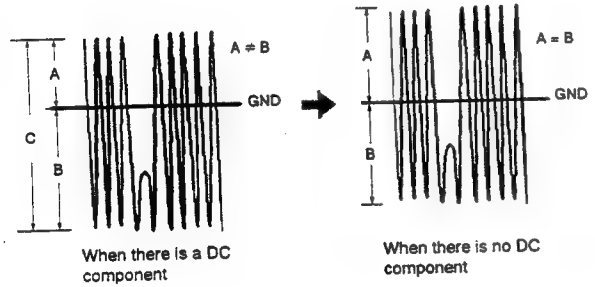
● Objective	To verify that there is no variation in the sensitivity of the tracking photo diode		
● Symptom when out of adjustment	Play does not start or track search is impossible		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus servos closed and tracking servo open None YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the MANUAL/TRACK SEARCH FWD ▶▶ • ▶▶| or REV |◀◀ • ◀◀ key.
2. Press the PGM (PROGRAM) key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Supposing that the positive amplitude of the tracking error signal at TP1 Pin 2 (TRK. ERR) is (A) and the negative amplitude is (B), the following expression is satisfied.

When $A \geqq B$, $\frac{A-B}{C} \times \frac{1}{2} \leqq 0.1$

When $A < B$, $\frac{B-A}{C} \times \frac{1}{2} \leqq 0.1$



When there is a DC component

When there is no DC component

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3. Pickup Radial/Tangential Tilt Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play Pickup radial tilt adjustment screw and tangential tilt adjustment screw 8–cm disc (with about 20 minutes of recording)

[Procedure]

1. Press the MANUAL/TRACK SEARCH FWD ▶▶ • ▶▶| or REV |◀◀ • ◀◀ key to move the pickup position toward the outer periphery of the disc.
   Press the PGM (PROGRAM) key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the respective servos and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with the hexagon wrench GGK1002 so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with the hexagon wrench GGK1002 so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 3).
   Note: A standard hexagon wrench can not be used as the disc hinders adjustment.
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.
5. When the adjustment is completed, lock the radial and tangential adjustment screw.

Note: Radial and tangential mean the directions relative to the disc shown in Figure 2.

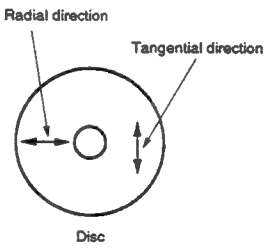
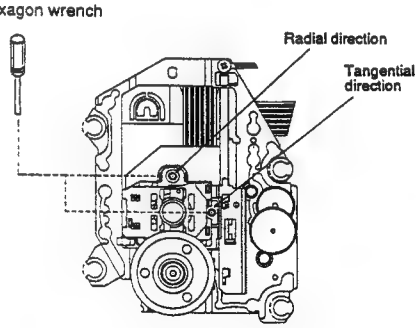


Figure 2



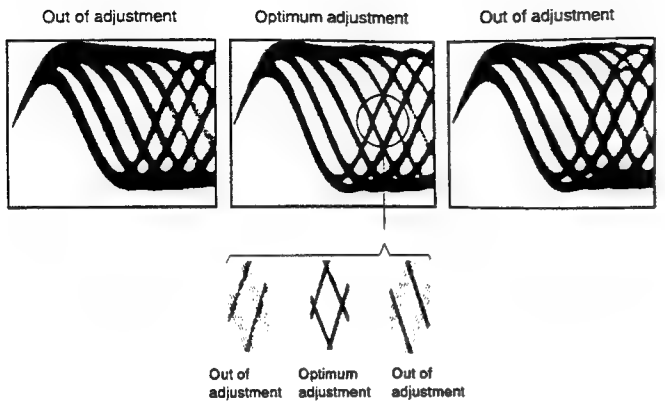


Figure 3 Eye Pattern

4. RF Level Verification

● Objective	To verify the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play None YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the MANUAL/TRACK SEARCH FWD ▶▶ • ▶▶| or REV |◀◀ • ◀◀ key, then press the PGM (PROGRAM) key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the respective servos and put the player into play mode.
2. Verify the RF signal amplitude is 1.2 Vp-p ± 0.2V.

5. Focus Servo Loop Gain Adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Figure 4. [Settings] CH1 20 mV/division CH2 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS. GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the MANUAL/TRACK SEARCH FWD ▶▶ • ▶▶| or REV |◀◀ • ◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PGM (PROGRAM) key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

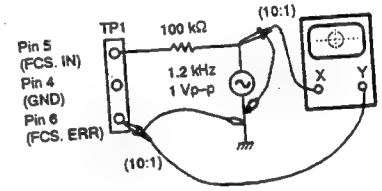
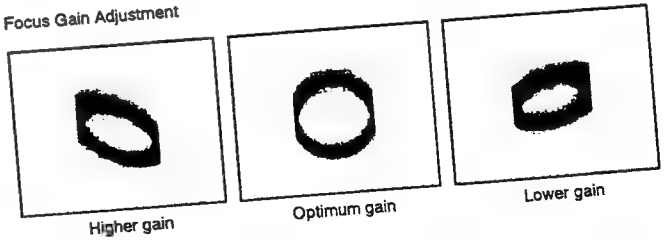


Figure 4

Focus Gain Adjustment



6. Tracking Servo Loop Gain Adjustment

● Objective	To optimize the tracking servo loop gain		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 5. [Settings] CH1 50 mV/division CH2 20 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR151 (TRK. GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the MANUAL/TRACK SEARCH FWD ▶▶ • ▶▶| or REV |◀◀ • ◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PGM (PROGRAM) key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

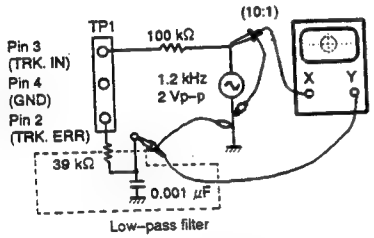


Figure 5

Tracking Gain Adjustment

Higher gain | Optimum gain | Lower gain

PD-P730T

10. FOR ABXJS AND ADL TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

PD-P730T/ABXJS, ADL and AEMXJS have the same construction except for the following:

Mark	Symbol & Description	Part No.			Remarks
		AEMXJS type	ABXJS type	ADL type	
⚠	Power transformer	PTT1279	PTT1279	PTT1272	
	Packing case	PHG1853	PHG1853	.....	
NSP	Rear base	PNA1889	PNA1905	PNA1989	
	Operating instructions (English/German/ Italian/Dutch/Spanish/Portuguese/Swedish/ French)	PRE1170	.....	.....	
	Operating instructions (English)	.....	PRB1179	.....	

11. SPECIFICATIONS

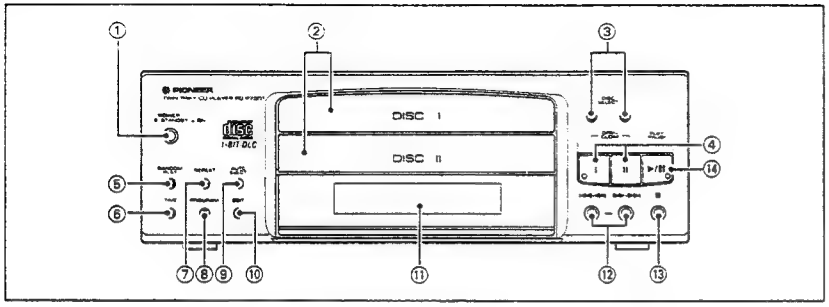
Type ..... Compact disc digital audio system
Discs used ..... Compact disc
Frequency response ..... 4 Hz—20 kHz
Number of channels ..... 2 channels (stereo)

Other
Dimensions ..... 260 (W) × 84 (H) × 255 (D) mm
Weight ..... 2.4 kg

Accessories
Operating instructions 1

NOTE:
The specifications and design of this product are subject to change without notice, due to improvements.

12. PANEL FACILITIES



FRONT PANEL

① POWER switch (■ STANDBY/▬ ON)
Press to turn power to the unit ON and STANDBY. This power switch is only secondarily connected; even when it is set to the STANDBY position, it does not disconnect the unit from the power supply.

② DISC (I, II) trays
Insert the discs here. When power is switched ON and OPEN/CLOSE button is pressed, the tray is ejected forward. To close the tray, press the OPEN/CLOSE button, or lightly push the tray in.

③ DISC SELECT buttons (DISC I, DISC II)
DISC I: Use to select DISC I for playback or programming.
DISC II: Use to select DISC II for playback or programming.

④ OPEN/CLOSE I, II buttons
Press when you wish to eject or load a disc. Each time the button is pressed, the tray alternately opens and closes.

⑤ RANDOM PLAY button
Press to begin random playback.

⑥ TIME button
This button selects the display mode of the display section. Each time the button is pressed, the indication changes from TIME, REMAIN, to TOTAL in that order. (For details concerning the display contents, refer to the explanation about the "DISPLAY SECTION".)

⑦ REPEAT button
Press this button for repeat playback. Pressing the button once, twice, or three times will change the repeat mode from single track repeat, to all tracks repeat, and repeat playback cancellation respectively.

⑧ PROGRAM button
Use to program a sequence of tracks.
- Press this button after selecting a desired disc and track with the DISC SELECT and Track search buttons. Tracks will be added in the program in the order in which they are specified.

⑨ AUTO EJECT button
Press to perform auto eject playback.
When a disc is finished playing, its disc tray will automatically open. The other disc tray will close and playback will start. By replacing discs, continuous playback can be maintained.

⑩ EDIT button
If this button is pressed for A.S.E.S. recording and the Manual/Track search buttons are used to designate the length (in minutes) of the recording tape, the CD player will automatically select and program the CD tracks to be recorded. The tracks will be selected for recording so that the empty portion remaining at the end of the tape will be as short as possible. For details regarding this function, consult the operating instructions for the receiver used.

⑪ Display

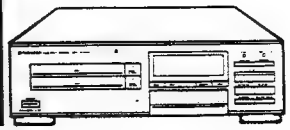
⑫ Manual/Track search buttons (⏮ • ◀◀, ▶▶ • ⏭)
To perform track search in normal playback, programmed playback or PAUSE mode. You can advance to the next track or go back to the previous one by using the Manual/Track search buttons. The Fast forward or fast reverse function will be activated by holding down these buttons.

⑬ Stop button (■)
Press to stop playback. When pressed, the player goes into stop mode and all operations stop. Press to clear a program. When pressed during stop mode, the program stored in memory is cleared.

⑭ PLAY/PAUSE button (▶/⏸)
Playback will begin if this button is pressed when the CD player is stopped or paused. Pressing the button during playback will cause the player to temporarily pause.

PIONEER
The Art of Entertainment

Service Manual



SERVICE GUIDE
ORDER NO.
ARP2144

TWIN-TRAY COMPACT DISC PLAYER

PD-Z74T

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

SO MAR. 1991 Printed in Japan

DISASSEMBLY AND REASSEMBLY PROCEDURE OF TWIN MECHANISM

1. DISASSEMBLY

1.1 REMOVAL OF TRAY I

(1) Set the tray I to the OPEN position by pressing the OPEN/CLOSE button.

Note: When openning the tray I manually, insert a finger from the groove and rotate the idler gear in clockwise direction, shown in Fig. 1–1.

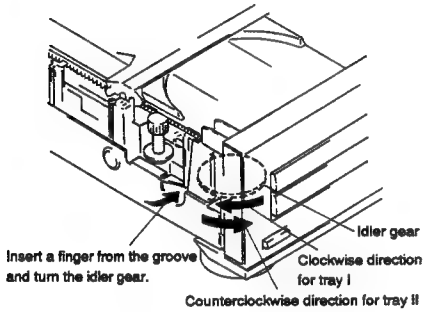


Fig. 1–1

(2) As shown in Fig. 1–2, insert a screw driver to the left slit of the tray I and pull out the tray in the direction of the arrow B, while the screw driver keeping to press in the direction of the arrow A.

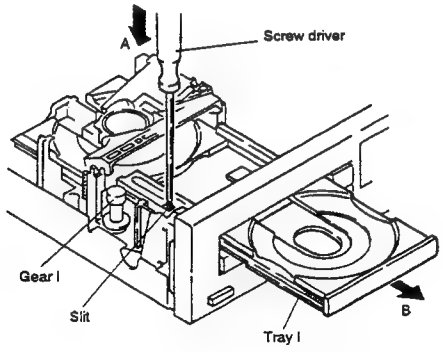


Fig. 1–2

1.2 REMOVAL OF TRAY II

(1) Set the tray II to the OPEN position by pressing the OPEN/CLOSE button.

Note: When openning the tray II manually, rotate the idler gear in the counterclockwise direction, shown in Fig. 1–1.

(2) As shown in Fig. 1–3, insert a screw driver to the right slit of the tray II and pull out the tray in the direction of the arrow B, while the screw driver keeping to press in the direction of the arrow A.

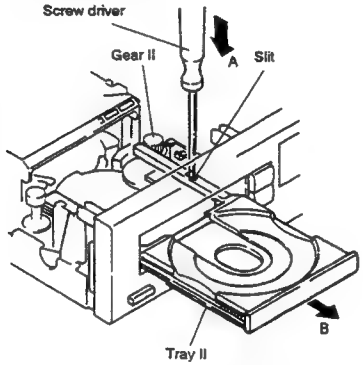


Fig. 1–3

1.3 REMOVAL OF CLAMPER ARM U AND B

(1) As shown in Fig. 1–4, rotate the idler gear so that the clamper assembly not to be clamped on the disc table. Next, take out the clamp sprig and the screw Ⓐ, and remove the clamper arm U and B.

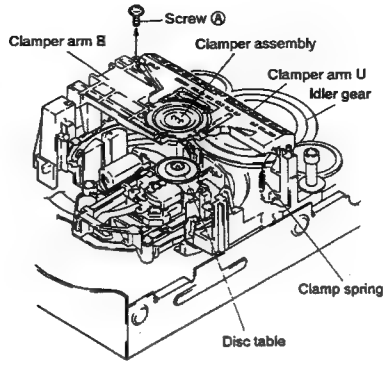


Fig. 1–4

1.4 REMOVAL OF SERVO MECHANISM ASSEMBLY

(1) Remove the tray I. (Refer to 1.1, REMOVAL OF TRAY I)
(2) Remove the tray II. (Refer to 1.2, REMOVAL OF TRAY II)
(3) Remove the clamper arm U and B. (Refer to 1.3, REMOVAL OF CLAMPER ARM U AND B)
(4) Remove four screws holding the servo mechanism assembly.

Note: As shown in Fig. 1–5, lead wires from the servo mechanism assembly are fixed by two hooks and a binder on the back of the twin tray mechanism section.

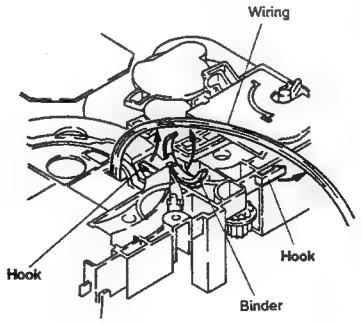


Fig. 1–5

1.5 REMOVAL OF LOADING BELT AND LOADING MOTOR

(1) Remove the tray I. (Refer to 1.1, REMOVAL OF TRAY I)
(2) Set the tray II to the OPEN position. (Refer to 1.2, REMOVAL OF TRAY II (1))
(3) Remove the belt and two screws Ⓑ, shown in Fig. 1–6.

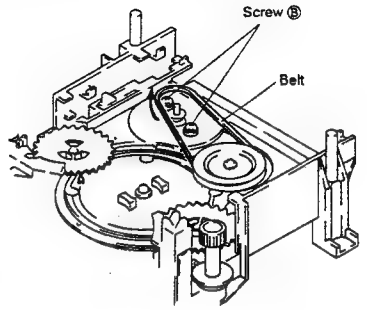


Fig. 1–6

(4) Set the tray II to the Close position.
(5) Remove screws holding the twin tray mechanism, and take out the twin tray mechanism from the body.
(6) Turn over the twin tray mechanism to set the position as shown in Fig. 1–7.
(7) Remove a screw Ⓒ holding the mechanism PCB assembly.
(8) Hold the A section of the mechanism PCB assembly and lift it up to the direction of the arrow, and remove the loading motor accompanied with the mechanism PCB assembly.

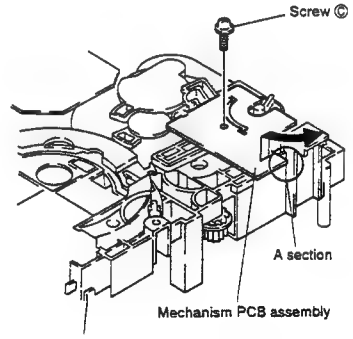


Fig. 1–7

2. REASSEMBLY

2.1 ASSEMBLY OF CLAMPER CAM AND FLOATING BASE

(1) As shown in Fig. 2–1, adjust the notches (3 points) in the clamper cam to the claws (3 points) of the loading base, and set the clamper cam to the position as the arrow shows.

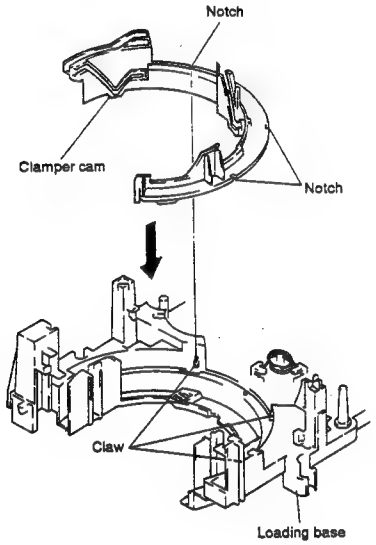


Fig. 2–1

(2) After adjusting the notches in the clamper cam to the claws (3 points) showing in Fig. 2–1, place the protrusions of the floating base on the grooves (2 points) of loading base as the arrow shows in Fig. 2–2.

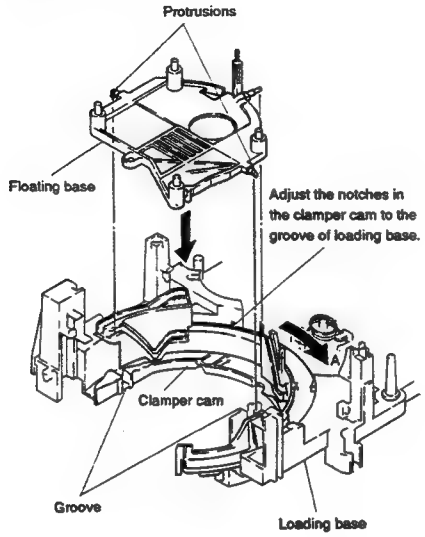


Fig. 2–2

(3) Rotate the clamper cam in the direction of the arrow A, and stop the rotation when the floating base reaches to the lowest position.

Note: Keep the floating base to the lowest position till the assembling of the main cam, follow gear, gear I, gear II, clamper arm U and B is completed.

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2.2 ASSEMBLY OF MAIN CAM, FOLLOW GEAR, GEAR I, GEAR II AND GEAR PULLEY

(1) As shown in Fig. 2–3, attach the main cam, trying to adjust the main cam hole A to the clamper cam protrusion. Next, hold it with screw Ⓓ.

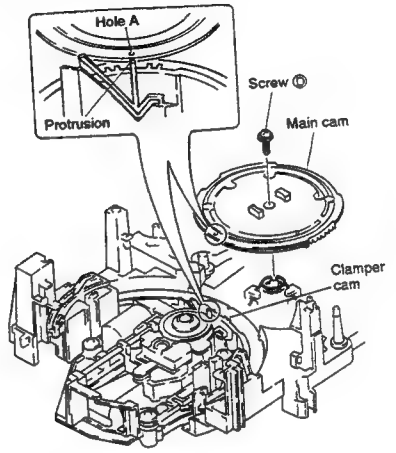

Fig. 2–3

(2) As shown in Fig. 2–4, after adjusting ♡ marks (2 points) on the main cam to the same marks on the two follow gears, insert them into the section A and B respectively.

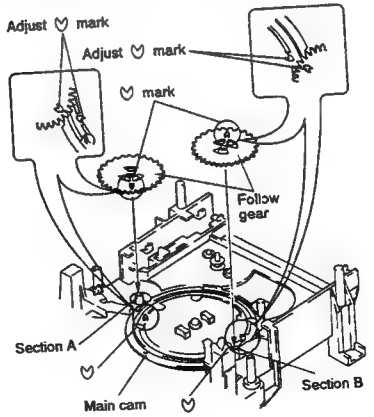

Fig. 2–4

(3) As shown in Fig. 2–5, adjust ⊓ mark on the gear I and the gear II to the hole ⊓ on follow gears, insert to positions shown in Fig., and hold them with two screws Ⓔ respectively.

(4) Insert the gear pulley to the position shown in Fig., and hold with the screw Ⓕ.

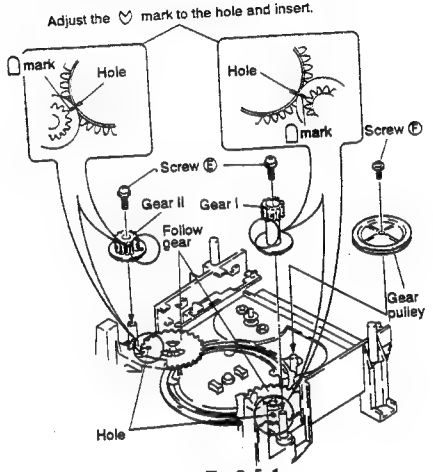

Fig. 2–5–1

(5) Finally, each gear position should be as follows.

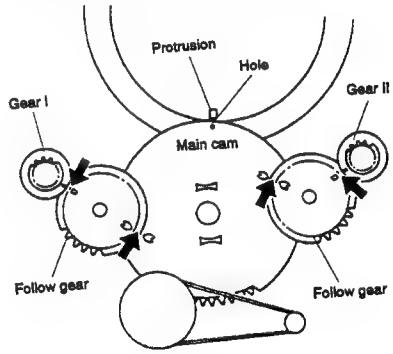

Fig. 2–5–2

2.3 ASSEMBLY OF CLAMPER ARM B, CLAMPER ARM U AND CLAMPER ASSEMBLY

(1) As shown in Fig. 2–6, insert the protrusion A of the clamper arm B into the groove of the loading base, and insert the protrusion C into the groove on the loading base, while the protrusion B being inserted into the groove on the clamper cam.

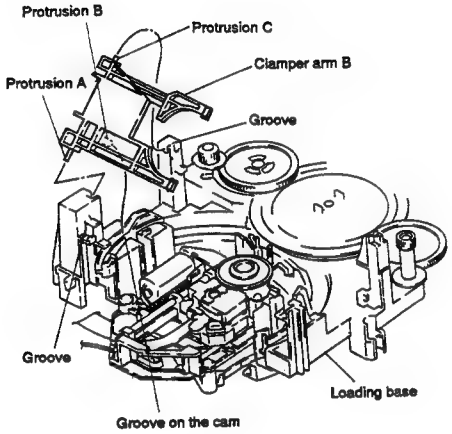

Fig. 2–6

(2) As shown in Fig. 2–7, attach the clamper assembly to the clamper arm B so that the protrusion D of the clamper assembly may turn to the position as Fig. shows.

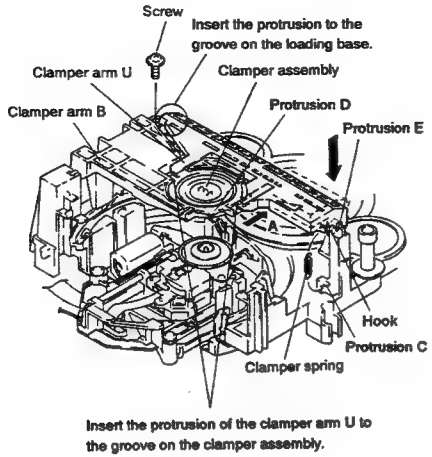

Fig. 2–7

(3) As shown in Fig. 2–7, insert the protrusion of the clamper arm U to the groove on the clamper assembly, and slide in the direction of the arrow A. Next, insert the protrusion of the clamper arm U to the groove on the loading base, while the protrusion E being pushed into the hook of the loading base.

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2.4 ASSEMBLY OF LOADING MOTOR

(1) Press down the motor pulley toward the upper surface of the loading motor, keeping the space of 3 mm between the motor pulley and the upper surface of the loading motor.

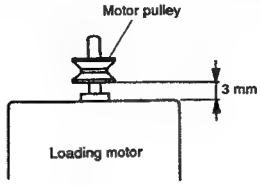

Fig. 2–8

(2) Solder the terminals of the loading motor to the mechanism PCB assembly. Since the loading motor has polarity, the positional relation between the label of the motor and the mechanism PCB assembly is shown in Fig. 2–9.

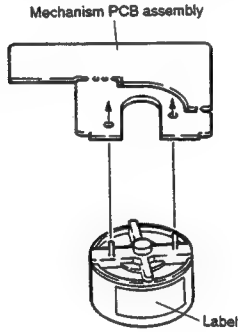

Fig. 2–9

(3) As shown in Fig. 2–10, after turning over the loading base, insert section A into the section B as the arrow shows, and fix with the screw Ⓒ.

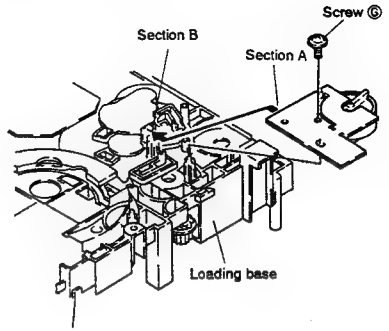

Fig. 2–10

(4) Turn over the loading base once again, and tighten the loading motor with two screws Ⓑ and set the belt as shown in Fig. 2–11.

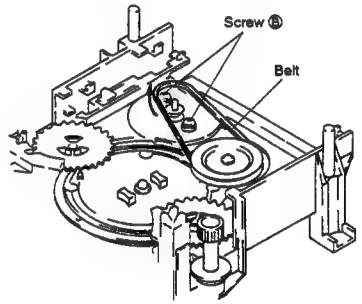

Fig. 2–11

2.5 ASSEMBLY TRAY I AND TRAY II

(1) As shown in Fig. 2–12, attach the lock lever and the lever spring to the sub tray (the two same forms), which must be placed to the left hand of the sub tray, if the sub tray is attached with the tray I, and which must be placed to the right hand of it, if it is attached with the tray II, looking from the front of the sub tray.

Note: Two lock levers are the same forms.

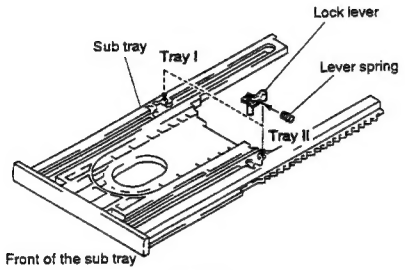

Fig. 2–12

(2) As shown in Fig. 2–13, attach the tray I or II to the sub tray by the hook applied to the section A. At that time note that the tray I has the gear on the left hand, and the tray II has the gear on the right hand. When attaching respectively, make sure the position where the lock lever attached.

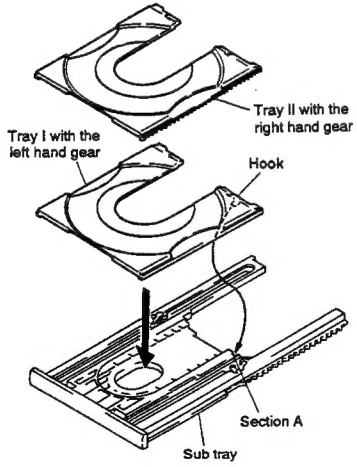

Fig. 2–13

(3) As shown in Fig. 2–14, turn over the tray, and put three screws Ⓗ on it.

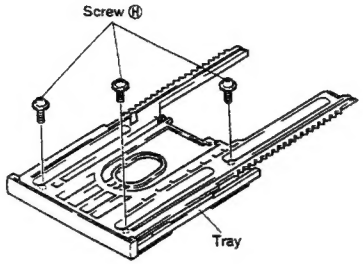

Fig. 2–14

2.6 ATTACHMENT OF TRAY II

(1) Press the OPEN/CLOSE button to make the tray I is in clamp condition, and the tray II is in open condition.

Note 1: When opening the tray II manually, insert a finger into the groove shown in Fig. 2–15, and fully rotate the idler gear counterclockwise. (As for the idler gear, refer to Fig. 1–1)

Note 2: Tray I should be attached after tray II's attachment has been completed.

(2) As shown in Fig. 2–15, adjust the □ mark on the gear II to the first tooth of the tray II, then push in the tray II slowly.

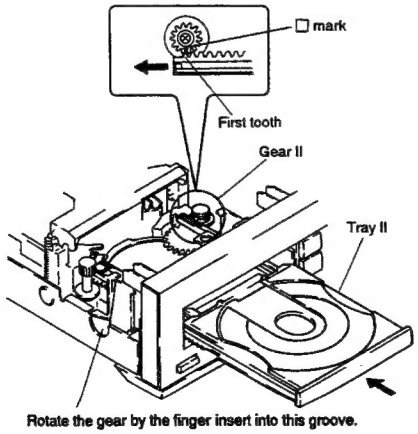

Fig. 2–15

PD-Z74T

2.7 ATTACHMENT OF TRAY I

(1) Press the OPEN/CLOSE button to make the disc II is in clamp condition, and the tray I is in open condition.

Note: When opening the tray I manually, insert a finger into the groove shown in Fig. 2–15, and rotate the idler gear clockwise, and tray II is clamped.
Further, rotate the idler gear, the pin pressing the switch appears at B position.When the pin moves to A position, stop the gear rotation. The gear I reaches to a position shown in the figure. At this position, attach the tray I.

(2) As shown in Fig. 2–16, adjust the first tooth of the tray I to the clogged part of the gear I, then push in the tray I slowly.

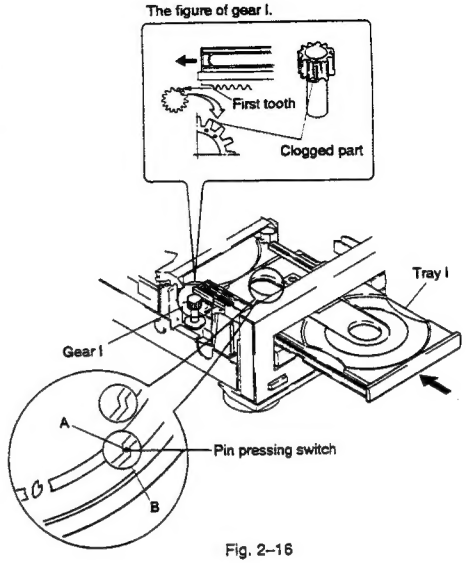

Fig. 2–16

2.8 STYLING

(1) Bend the wires as shown in Fig. 2–17.

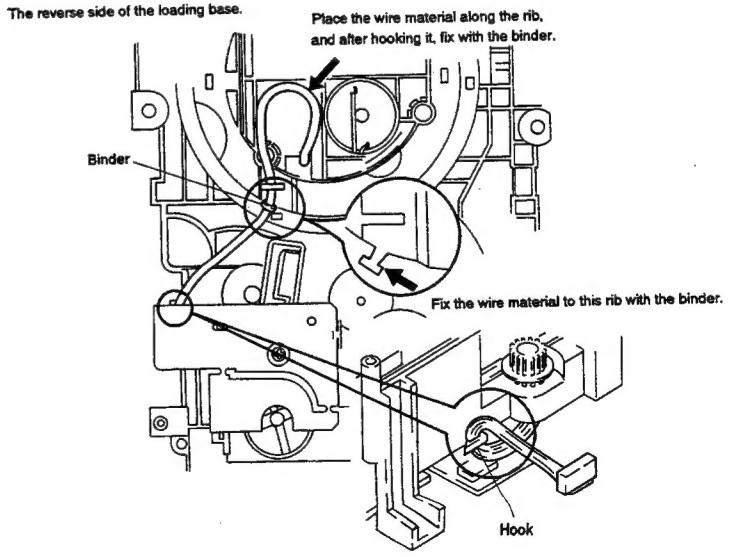

Fig. 2–17

3. OPERATION OUTLINE

3.1 CHARACTERISTICS

The twin–tray mechanism of this unit is characterized by two basic features.
The first one is that both trays are driven by only one loading motor like in conventional single–tray system. This is a continuation of the design thought underlying the last generation twin–tray mechanism.
The second feature is the sandwiched tray design together with the utilization of a vertically moving servo mechanism for clamping, and horizontally arranged parts, resulting in a simplified construction and reducing the depth and width of the mechanism. As a result, the dimensions of the tray mechanism are almost the same size as for conventional single–tray system.
In addition, the mechanism is suited for mini–sized (260 mm width) products.

3.2 STRUCTURE OF THE TRAY SECTION

The tray section consists of a tray and a sub tray, as shown in Fig. 3–1. The tray slides in the sub tray grooves and is secured by three screws.
The switching between tray and sub tray operation is performed via a lock lever mounted on the sub tray.

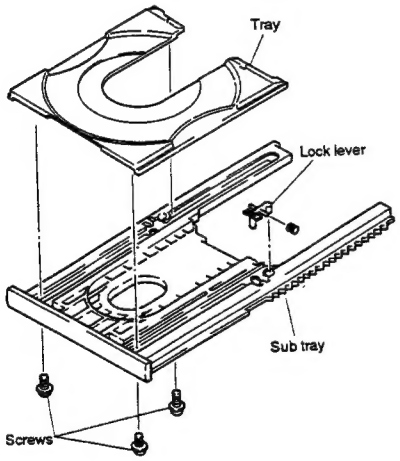

Fig. 3–1

As shown in Fig. 3–2, while the tray is opening or closing, the lock lever is held in the guide rib notch portion of the sub tray by the force of the lever spring, so that tray and sub tray move as one unit.

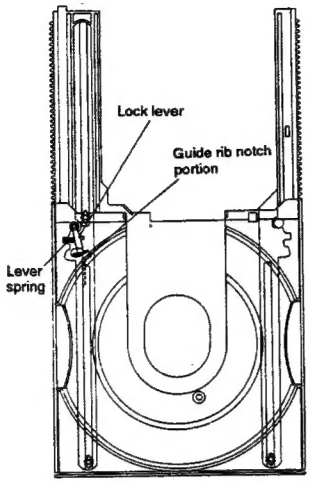

Fig. 3–2

When the tray is closed, the lock lever is disengaged from the guide rib notch of the sub tray by way of the guide groove in the loading base, and the interlocking between tray and sub tray is released.

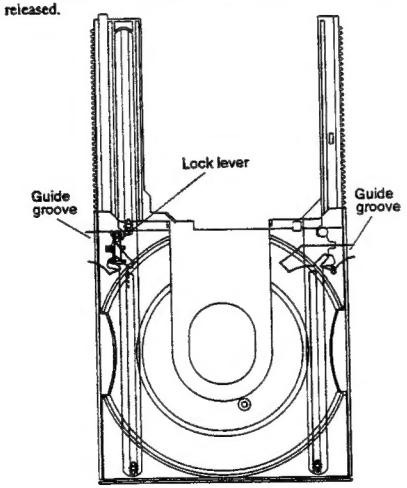

Fig. 3–3

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When CHANGE or PLAY button is depressed, only the tray moves on the sub tray, as shown in Fig. 3–4. The driving gear for tray I is located on the left side of the tray and the lock lever is mounted on the left side of the sub tray. The driving gear and the lock lever for tray II are located on the right side.

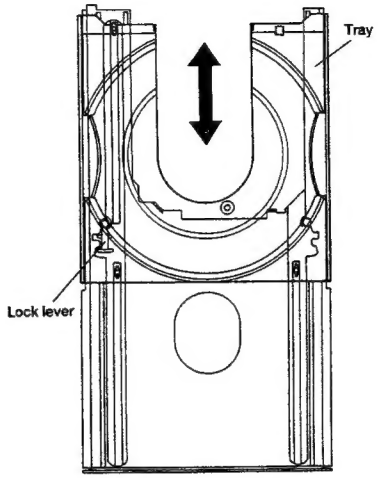

Fig. 3–4

3.3 POWER TRANSMISSION FROM THE LOADING MOTOR

As shown in Fig. 3–5, the rotation of the loading motor is transmitted to the main gear via a rubber belt, gear pulley, and idler gear.
The follow gears located on both side of the main gear are synchronized with the rotation of the main gear and rotate gear I and gear II respectively. Gears I and II drive the two trays.

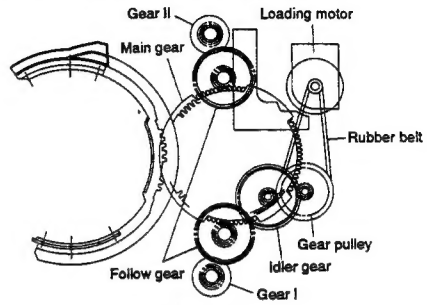

Fig. 3–5

As shown in Fig. 3–6, the drive power of the tray is transmitted by gears I and II to the gear section on the side of the sub tray and the tray. When the OPEN button is depressed, only the sub tray side is engaged, changing over to the tray side half–way between tray OPEN position and tray CLOSE position and then driving only the tray side to perform operation switching by the lock lever.

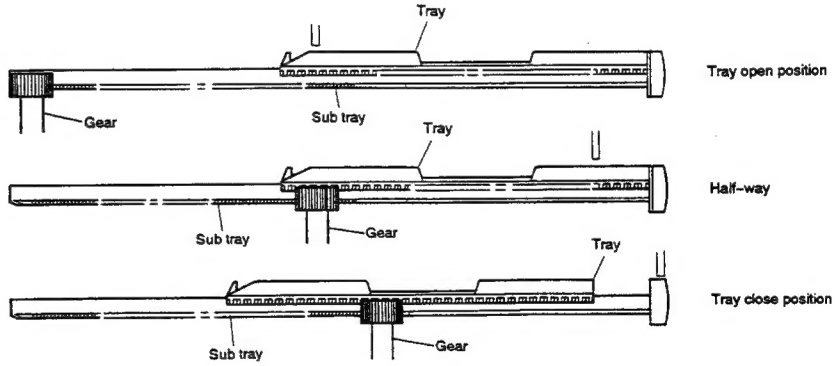

Fig. 3–6

The clamp cam, as shown in Fig. 3–7, rotates in synchronization with the main cam rotation to move the float base vertically. The cam groove of the clamp cam drives clamper arm B which, together with clamper arm U and the clamper holder, moves the clamper assembly up and down. (Refer to Fig. 1–4)

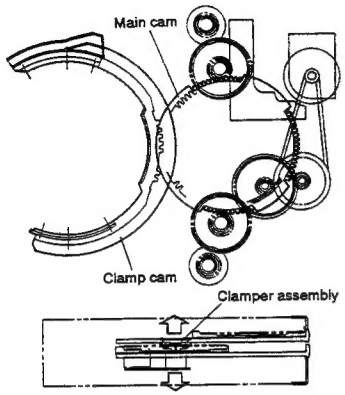

Fig. 3–7

3.4 TRAY POSITION DETECTION

The mechanism for tray position detection is shown in Fig. 3–8. The tray position is detected by the tips of three plastic springs, which are located on the loading base to follow the change of diameter in two grooves on the rear side of the main cam, and the ON/OFF condition of three switches located on the mechanism board.

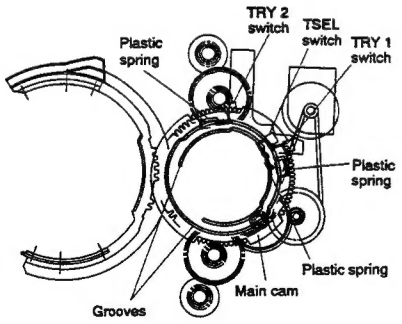

Fig. 3–8

3.5 MAIN CAM OPERATION

The main cam performs switching between operations.

(1) OPEN/CLOSE Operation

The two follow gears are located on the left and the right side of the main cam respectively. The left follow gear drives tray I via gear I and the right follow gear drives tray II via gear II.

As shown in Fig. 3–9, when tray I is in OPEN position, the left follow gear is engaged with the main cam gear. The non–toothed sections of the right follow gear and the main cam face each other, and the follow gear does not rotate. Therefore, when the motor rotates to tray I CLOSE direction (main cam rotates counterclockwise), only the left follow gear is driven to tray I to CLOSE direction. At this time, tray II is in the PLAY position.

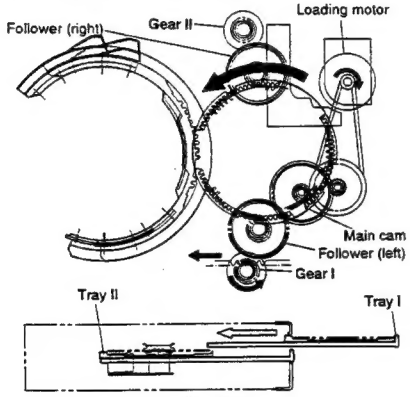

Fig. 3–9

		TRAY1	TRAY2	TRY1 switch	TSEL switch	TRY2 switch	Remarks
MECHANISM POSITION	①	OPEN	PLAY	L	H	L	When tray 2 is in play position, indicates that tray 1 has arrived in open position from close position.
	②	OPEN/ CLOSE	PLAY	H	H	L	When tray 2 is in play position, indicates that tray 1 is between close position and open position.
	③	CLOSE	PLAY	H	L	L	When tray 2 is in play position, indicates that tray 1 is at close position.
	④	CHANGE	CHANGE	H	L	H	When there is transition from ④ to ⑤, indicates that there is movement in progress with tray 1 to play position and tray 2 to close position.
	⑤	CHANGE	CHANGE	H	H	H	When there is transition from ⑤ to ④, indicates that there is movement in progress with tray 1 to close position and tray 2 to play position.
	⑥	PLAY	CLOSE	L	H	H	Indicates that tray 1 is in play position and tray 2 in close position.
	⑦	PLAY	OPEN/ CLOSE	L	L	H	When tray 1 is in play position, indicates that tray 2 is between close position and open position.
	⑧	PLAY	OPEN	L	L	L	When tray 1 is in play position, indicates that tray 2 has arrived in open position.

As shown in Fig. 3–10, when tray I is in CLOSE position, the non–toothed sections of the main cam and the left follow gear face each other, so that the follow gear does not rotate. At this time, the right follow gear is still positioned at the non–toothed section of the main cam so that tray II remains in PLAY position. OPEN/CLOSE operation of tray II is performed by reversing the above operation.

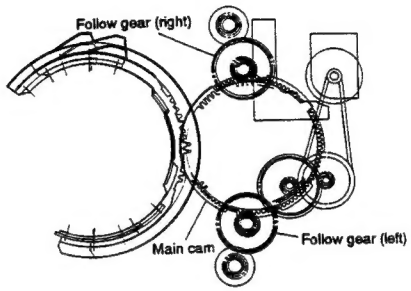

Fig. 3–10

(2) DISC Change Operation

As shown in Fig. 3–11, when tray I is in CLOSE position and tray II is in PLAY position, the follow gears (right and left) do not rotate as described above. At this time, the single tooth of the main cam and the 2–tooth of the clamp cam will be engaged and the clamp cam starts to rotate.

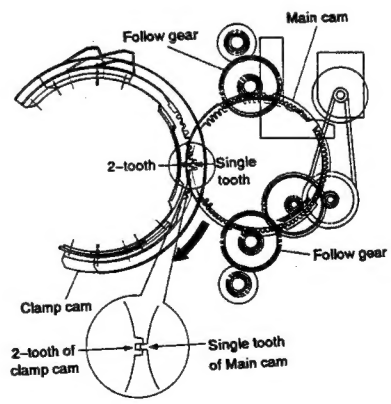

Fig. 3–11

When the main cam rotates counterclockwise as shown in Fig. 3–12, the clamp cam also rotates synchronously. The float base supported by the loading base guide moves down along the three V–shaped cams of the clamp cam. At the same time, the clamper arm moves along the groove on the right side of the clamp cam to raise the clamper assembly. By this operation the DISC clamp is released.

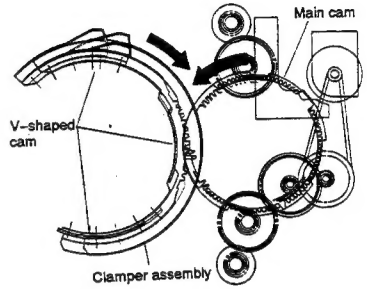

Fig. 3–12

When the main cam rotates further as shown in Fig. 3–13, the float base moves to the valley of the V–shaped cam and the gear section of the main cam and the follow gears are engaged. The follow gears (right and left) simultaneously rotate in clockwise direction. Driven by the follow gears, gears I and II rotate and simultaneously move tray I from the CLOSE position to the PLAY position and tray II from the PLAY position to the CLOSE position.

By this operation the DISC is changed. At this time, the non–toothed sections of the clamp cam and the main cam face each other so that the cams do not rotate.

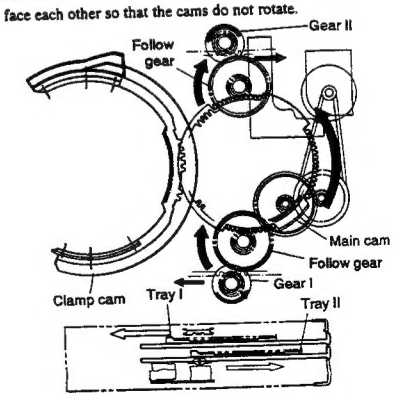

Fig. 3–13

As shown in Fig. 3–14, the second level gear of the main cam and the clamp cam gear engage just before the movements of tray I and tray II are completed, and the clamp cam starts to rotate again. The right and left follow gears face the non–toothed sections of the main cam, and at the same time the rotation stops.

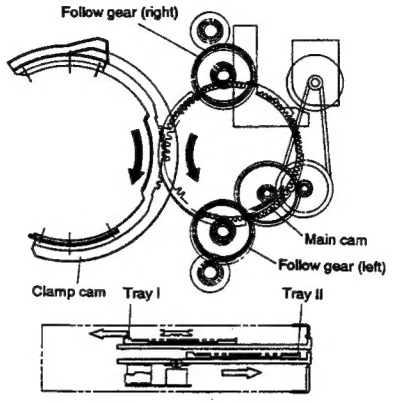

Fig. 3–14